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THE JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY

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EDITORIAL

IMPRESSIONS OF THE INTERNATIONAL CONGRESS

THE recent International Congress of Psychology has passed into history, and we can view its salient issues and controversies with a certain detachment. That the session, on the whole, was well conducted, and that it offered valuable opportunities for the interchange of a wide range of scientific viewpoints and methods, no one can deny. The sharp contrasts of personalities coming from different national settings and from varying cultural and philosophical backgrounds presented a novelty and a piquant charm not often felt in scientific gatherings. To be sure, nationalism was an occasional embarrassment through the emotions aroused in the effort either to uphold or to transcend it. A certain regrettable provincialism of thinking was occasionally shown by Americans as well as Europeans. In the all too conspicuous lack of familiarity with other languages the Americans again were by no means the least offenders; and this handicap was an evident source of irritation both in personal contacts and in the conduct of the programs. Certainly the cultivation of a deeper understanding of scientific culture patterns other than our own and of greater fluency in foreign languages are crying needs for the development of psychology as a world science. Barring these limitations, however, the evidences of international good fellowship and consciousness of a common scientific interest were unmistakable. One of the greatest satisfactions a scientist can have is to feel that his work is both understood and appreciated by scholars in other lands; and such recognition was assured, in ample measure, by the international character of the programs and the manner in which the papers were received by psychologists from many countries.

As for world progress in psychology, as shown in the Congress,

the present writer was impressed by a somewhat uneven development. Perhaps it is not an accident that, in our age of mechanical invention, psychological *techniques* should recently have undergone such remarkable refinement and expansion. Not only in the traditional field of experimental laboratory psychology, but in new and elusive subjects, such as child psychology and social psychology, where we were previously merely groping for methods, have ingenious devices been invented for the investigating and recording of behavior. The wide ramifications of the use of the cinematograph, both here and abroad, is but one example of this development. But along with this emphasis upon technique and ingenuity in the mechanical phase of experimentation there has been, it is to be feared, a dearth of resourcefulness in the broader problems of methodology and in the theoretical foundations of research. Technical progress in a science, though an indispensable aid to discovery, can avail little without the ability to form hypotheses, to criticize, and to set up experimental tests of the generalizations advanced. The instances revealed at the Congress in which an investigator had kept his technique subordinate, and had managed to set up and conduct a really crucial experiment were all too few. To take but one illustration—meticulous observation of developmental levels of behavior has been an absorbing interest. Elaborate and effective devices have been constructed for observing how well a child can do certain tasks at various ages. While there is no doubt of the scientific character and usefulness of these efforts, they suggest, perhaps, an obsession with the intelligence or achievement scale and an interest only in proving inheritance theories or in facilitating the practice of child guidance. If closer attention had been given not merely to what children do at different ages, but to how they come (by learning or inheritance) to do it, these ingenious techniques might have yielded results of greater significance.

There were a few contributions to the Congress, however, which stood out as crucial, and which opened up new vistas for the study of human and animal behavior. The older controversial distinctions between various schools of psychology are gradually subsiding. Structuralism, Behaviorism, Gestalt Psychology, as viewpoints for research, have all made their methodological contributions. Their significance being accepted by psychologists universally, these terms tend to lapse into disuse. The names of the special schools were, in fact, seldom heard at the Congress. There stood out, however, in contrast, a number of recent empirical

discoveries, not classifiable under any particular school or theory, but challenging all previous thinking and pointing to new fields to be explored. That the note of controversy was struck anew through these findings by different investigators (as, for example, between the new "configurational" neurology and the reflexologists) is probably not an evil omen, but a good one.

No one person, of course, could have attended or passed judgment upon all the papers of the vast program of the Congress. Hence it would be difficult to extract an authoritative list of the truly brilliant and crucial investigations. The present writer, however, would especially note the learning experiments of Thorndike, the researches upon the neurological foundations of behavior reported by Lashley, problems of perception formulated by Michotte, the embryological studies of Coghill, the reopening by William McDougall of the problem of the inheritance of acquired habits (an issue long regarded as settled), the studies of child behavior reported by Piaget and Madame Bühler, and the recent discovery by Pavlov of factors influencing reflex behavior. Amid the effusion of mechanical devices, tests, and psycho-technical applications, such contributions stood out as evidence that the underlying problems of psychology have not been forgotten. And it is the stimulus derived from these experiments, together with the memory of the personalities conducting them, which remains most vividly with us as the Ninth International Congress of Psychology recedes into the past.

SOME PHASES OF THE PSYCHOLOGY OF PREJUDICE

By WILSON D. WALLIS
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THE procedures of science are largely determined by its prearranged categories. In measurements of lobsters in which the lengths represent continuous and not discontinuous series, the observer reports more lengths of eleven inches and of twelve inches than of eleven and three-fourths or twelve and one-fourth inches. The disproportionately high frequency of even numbers does not correspond with the facts, since lobsters have no particular respect for the even inches of English mensuration. There is a disposition to segregate values around whole numbers, whether the facts justify this or not. Scientific investigation does not destroy human predispositions but merely gives them new scope. "It would be far less misleading if they were wrong as to the facts, and right in their view of the facts. As it is, they illustrate the too little considered truth that the fashion in which we think changes like the fashion of our clothes, and that it is difficult, if not impossible, for most people to think otherwise than in the fashion of their own period." "Opinions having been once supposed to be right they are never discovered to be erroneous." "The greatest obstacles to the advancement of human knowledge", says Buffon, "lie less in things themselves than in man's manner of considering them. . . . It is less difficult to see Nature as she is, than as she is presented to us. She carries a veil only, while we would put a mask over her face; we load her with our prejudices, and suppose her to act and to conduct her operations even after the same fashion as ourselves." Eighteenth century fashions have given place to twentieth century ones, but Buffon's remarks still hold. "Naturalists are made of much the same stuff as other people, and, if they are wise, will look upon new theories with distrust until they find them becoming generally accepted." Bacon speaks of "the contemplation of things as they are, without superstition or imposture, without error or confusion", as a "nobler thing than a whole harvest of inventions"; but does "seeing things as they are" mean anything? They are nothing until they are seen, and what they are depends upon how they are seen. Thanks to a perverse intellectual modesty

men do not like to view the naked truth, and they cover it with prepossessions until its very nature is concealed. "Science", it has been said, "is of no party. It seeks no object, selfish or unselfish, good or bad. It is unmoved by any emotion; it feels no pity, nor is it stirred by any wrong. Its sole aim is the investigation of truth and the discovery of law, wholly indifferent to the use to which those investigations and those discoveries may afterwards be put." This refers not to actual but to ideal science. As a matter of fact, "our attachment to one division, or to one sect, seems often to derive much of its force from an animosity conceived to an opposite one: and this animosity in its turn, as often arises from a zeal in behalf of the side we espouse, and from a desire to vindicate the rights of our party." As an example of the presuppositions and prejudices of science, the theory of evolution, as represented by Darwinism, will serve. Science may be forgiven much, for it had a long fight to maintain its ground, and even its very existence, as a field in which truth might be sought unhampered. Darwinians became militant, and some rallied to the cause as fighters rather than as seekers for the truth. A man was for or against the theory of evolution—with the apes or with the angels—and his intellectual position was brought into line with his emotion. The Darwinians snub Samuel Butler as they snub the ecclesiastics who are against them. To them evolution *a la* Darwin is no longer a postulate or a theory, but an indubitable fact; Natural Selection becomes a God, and Darwin its prophet; phantoms of imagination become creatures of reality about whose characteristics men speak with the assurance of those who have experimental knowledge; for "men of science are of like passions even with the other holy ones who have set themselves up in all ages as the pastors and prophets of mankind". Wherefore, "no one who has not a strong social position should ever advance a new theory, unless a life of hard fighting is part of what he lays himself out for". Even the archeologist is easily led astray by a state of mind. "Let an archeologist once become obsessed with the idea that a defaced inscription must be read in a particular way, or that an abraded figure must have been vested in some particular costume, and he is lost: his eyes will follow the dictates of his mind. In such cases it is often an expedient of real value to submit the point in dispute to the judgment of an intelligent and observant *child,* who, having no theories, will be unbiased." Thus one whose pursuit is archeology.

As Pasteur's biographer says of the misunderstanding oppo-

nents of that great chemist: "Why be surprised that certain minds deeply disturbed in their habits, their principles, their influence, should feel some difficulty, some anger even, in abandoning their ideas? If it is painful to tenants to leave a house in which they have spent their youth, what must it be to break with one's whole education?" A physical anthropologist who was preparing a critique of evidence bearing on man's simian ancestry, sent the manuscript to a friend anatomist who stood high in the profession and had a reputation for fairmindedness and acumen. He replied: "This manuscript makes me regret the freedom of the press. Under ordinary circumstances it would be innocent and harmless enough, but I can't but feel that you are giving unnecessary comfort to the enemy. I'll plead guilty to strong personal bias on the subject. Of course I try to be open to reason but realize at times that I don't altogether succeed."[1] In keeping with this tendency to champion a view rather than to examine it, there are cliques among "scientific" men as well as among men of other calling: Here and there a group which agrees with itself and is always patting itself on the back for its acumen and superhuman wisdom. If one writes a book his brother-in-the-bond steps up with a review, saying: "Now see! *We* hold so and so. Dr. ——— has produced a masterpiece incorporating the wisdom of the ages. I agree with all he says. True, one might criticise this or that detail, but in its broad outlines the work stands out", etc., etc. When a member of a rival clique expresses his views a fair hearing in certain quarters is impossible. These cliques sometimes are localized, perhaps nationalized, but this is by no means always the case. The bond may be a common interest, common because interest is the same, or an interest because of the discovery of a common bond. Such a common bond sometimes has the spell of bondage. Evolutionists and anti-evolutionists are examples of this last—applying the terms to those who are champions of a theory rather than judges weighing and weighting the evidence. Much good may come from championing a cause which appears superior to alternative causes; but no good can come from championing the theory that this is the best cause, if championing it means supporting it in a militant spirit. As Sir Thomas

[1] One who wrote this man's obituary says he was "unprejudiced and cultivated no scientific bias. His attitude toward new ideas and new methods was unvaryingly receptive, though critical." But he knew himself better than did the writer of his obituary.

Browne says, "In all disputes, so much as there is of passion, so much there is of nothing to the purpose; for then reason, like a bad hound, spends upon false scent, and forsakes the question first started. And this is one reason why controversies are never determined; for, though they be amply proposed, they are scarce at all handled, they do so with unnecessary digressions, and the parenthesis on the party is often as large as the main discourse upon the subject. . . . There remain not many controversies worthy a passion, and yet never any dispute is without, not only in divinity but inferior arts. . . . Yea, even amongst wiser militants how many wounds have been given and credits slain for the poor victory of an opinion or beggarly conquest of a distinction! Scholars are men of peace, they bear no arms, but their tongues are sharper than Actious his razor; their pens carry further and give a louder report than thunder. I had rather stand in the shock of a basilisco than in the fury of a merciless pen."

"Truth", as Renan said when introducing Pasteur to the Academy, "Truth is a great coquette; she will not be sought with too much passion, but often is most amenable to indifference. She escapes when apparently caught, but gives herself up if patiently waited for; revealing herself after farewells have been said, but inexorable when loved with too much fervor." There is a sense in which a given truth, like a virtuous woman, needs no champions, and is the better for having none. "Truth needs no policies, no stratagems, no licensings, to make her victorious. Whoever knew Truth put to the worse in a free and open encounter?"

All of us, of course; but the free and open encounter is the only one which can be defended, for truth can be defended only by truth, and if not so, then not at all. And the surest way to cast doubt on the truth is to implore people to believe it. A truth must not be hampered by being too well defended; for a multitude of defenders only conceal her from the world. Unwittingly they tend to identify themselves and their attributes with truth and its attributes. Indeed defenders are apt to handicap a truth as much as are attackers, for zeal stimulates zeal, and people are prone to attack a view if they are told that they may not do so. The wise man chooses his problems wisely and wisely keeps them problems. Of course, it is important to be right, but to be right in the right way rather than in the wrong way. Some people are so violently right in the wrong way as almost to turn the truth into an error. I am fully convinced of the truth of the theory that the earth

revolves on its axis, yet I would not accept membership in the "Society for Perpetuating the Belief in the Revolution of the Earth on Its Axis". I would look with suspicion upon such an organization: I would suspect its intellectual integrity; I would question its motives; I would suspect that other purposes were bound up with the desire to perpetuate belief in the revolution of the earth upon its axis. Revolutions in ideas we fear as our intellectual ancestors feared the idea of a revolution of the earth. Indeed a revolution in ideas is more effective than ideas of revolution, for until ideas are revolutionized the State is not revolutionized. A few forms are changed, the center of authority shifts, but it is the same old body politic with the cerebellum doing work formerly assigned the cerebrum, a little faster pulse and tenser muscles, but with no superior functioning of the vital parts, no concentration on new and worthier purposes, no choice of new means more adequate to the end, and no choice of worthier ends. Only when revolution affects men's minds, not merely touching but reorganizing and reorienting them, does it accomplish a noteworthy task. Science needs no defenders of any particular truth—the fewer the better—but only of the right freely to seek the truth. She needs not the opportunity to bask in the assurance of a truth or of the truth, but the opportunity to search eagerly, persistently, humbly, for a glimpse of truth, permission to follow the gleam, not a commission to lead in a fray. Let men fight, whenever there is need, for the right to believe, but may they never be ready to take up arms for the right of their belief. The search for truth shall make them free. Men who are subject to service at the call of an external power to that extent are not free. Only he who seeks the truth is free, and only he who is free can seek the truth. "The ideal scientist should know neither self nor friend nor foe—he should be able to hob-nob with those whom he most vehemently attacks, and to fly at the scientific throat of those to whom he is personally most attached; he should be neither grateful for a favorable review nor displeased at a hostile one; his literary and scientific life should be something as far apart as possible from his social; it is thus, at least, alone that any one will be able to keep his eye single for facts and their legitimate inferences." "Scientific truth soars above the proprieties of friendship", said Pasteur. Is this not better than the sentiment: "Professor ——— is not an embryologist but he is an old friend of mine—else I should

have been much more severe in my comments on his article which shows ignorance and misunderstanding of the point at issue."[2] Knowledge is conditioned by the times, and the predispositions of the scientist are similarly conditioned. Here, as elsewhere, "truth scarce ever yet carried it by vote anywhere at its first appearance", and a new theory which upsets time-honored ones encounters spontaneous opposition from the world of science irrespective of its merits. When the germ theory of disease was propounded to the medical world, few people could turn the intellectual somersault. Like other people the scientist suffers from the pain of a new idea. With him as with other mortals a really new idea fits about as comfortably as a new shoe. The prejudice of scientists takes the form of a preference for their own school and an unreadiness to accept the view of opposing schools. Nationality enters and science becomes parochial; none the less so if the dividing line be by hemispheres or by Occident and Orient. The words of Milton ring true today: "Error supports custom, custom countenances error; and these two between them with numerous and vulgar train of their followers, envy and cry down the industry of free reasoning, under the terms of humor and innovation. Truth never comes into the world, but like the bastard, to the ignominy of him that brought her forth; till Time, the mid-wife, rather than the mother of truth, hath washed and salted the infant, and declared her legitimate."

The lines which came to Henry Sidgwick in his sleep make a suitable text for a discussion of the psychology of prejudice

> We think so because all other people think so;
> Or because—or because—after all, we do think so;
> Or because we were told so, and think we must think so;
> Or because we once thought so, and think we still think so;
> Or because having thought so, we think we will think so.

He who is in the grip of a strong conviction thinks that the man who differs from him must be deficient in reasoning powers, for the views of the latter are obviously stupid. To controvert them he distorts them until they become ridiculous. We see new things through old eyes, through the medium of familiar experiences and conceptions. For example, we perceive sounds only in a fixed scale to which we have grown accustomed. If a sound in a strange language, such as Micmac or Hopi, is intermediate between our *t* and *d*, or our *p* and *b*, we hear it not as the true intermediate

[2] Quoted from a letter written by an eminent contemporary zoölogist.

which it is, but rather as *t* or as *d*, as *p* or as *b*. With musical notes the same is true. Cords which on a Siamese xylophone are identical combinations, sound to us major and minor, respectively. Familiarity brings emotional accommodation as well as intellectual comprehension. Arabic music is displeasing to Europeans who hear it for the first time; yet nearly all Europeans, when they become accustomed to it, like it. The emotional tinge varies with intellectual apprehension and familiarity, and we interpret things to serve our purposes. William Hazlett describes a party composed of men, women, and children, at which two persons, "of remarkable candor and ingenuity were laboring (as hard as if they had been paid for it) to prove that all prayer was a mode of dictating to the Almighty, and an arrogant assumption of superiority." When a gentleman present remarked that the Samaritan's prayer, "Lord, be merciful to me a sinner," did not strike him as coming under that category, there was temporary respite, and after a while the objector left. "On which one of them observed with great marks of satisfaction and triumph—'I am afraid we have shocked that gentleman's prejudice.'" The blindness of such people consists in a fatigue from much looking at their own side of the question; no energy remains with which to view the other side. One recalls the argument of the German who insisted that stupid children make invincible soldiers, inasmuch as the gods themselves fight in vain against stupidity—*Gegen die Dummheit streben die Götter selbst umsonst.* Human reason Luther compared to a drunken man on horseback: "set it up one side and it tumbles over on the other." We go through life lopsidedly maintaining one thesis and moved from it, if at all, only to some other extreme. We affirm our age and ridicule all others. We confuse "facts" with theories, inference with observation, postulate with induction, and relative values with absolute ones.

"One believes what one wishes to believe." The faculty of doubt is rare, and few cultivate it. All of us have a touch of the "genius of swathing the bitter facts of life in bandages of soft illusion." "Behind this almost unanimous distrust of the truth-teller there is a sound and sure instinct, as there is behind every other manifestation of crowd feeling. What it shows is simply this: that the truth is something too harsh and devastating for the majority of men to bear. In their secret hearts they know themselves, and they can suffer the thought of themselves only by idealizing the facts. The more trivial, loathsome and degraded

the reality, the more powerful and relentless must be the idealization. An Aristotle may be able occasionally to regard himself searchingly and dispassionately—but certainly not the ordinary man. Here we come back to the inferiority complex. The truth-seeker forgets it, and so comes to grief. He forgets that the ordinary man, at bottom, is always afraid of himself, as of some horrible monster. He refuses to sanction the lie whereby the ordinary man maintains his self-respect. . . . Thus he is unpopular, and deserves to be."

Belief and wish are so near akin that the belief which can not be proved is a wish that what we believe to be true may actually be true. That is why the bitterest antipathies are found among those whose interests are most alike rather than among those whose interests and points of view are most diverse. In the second century A.D. the severest diatribes against the Jews came from that section of Christians, the semi-Jewish, which had embodied most elements from Jewish theology; hence it was most exposed to and most sensitive about being confounded with Jews. Since that time what a hard time a man has had in Christendom if his ancestor happened to be closely related to Jesus! The motion of censure of an outspoken anti-slavery member of Congress in 1842 came from a member of that political party which had most, not from the one which had least, anti-slavery in its ranks; and this spirit of belligerent offensive defense is not exceptional. The Fundamentalist fights fellow-Protestants rather than Roman Catholics, Jews, Mohammedans, Buddhists, Taoists, Shintoists, or atheists.

Similarly it was the antiseptic school of Lister which combated most acrimoniously the aseptic school which was urging better methods. "It was the proponents of Lister's method rather than the more conservative surgeons who opposed it. They had attached such vehement emotional tone to their practice, they had such a psychological vested interest in it, that they resented any improvement upon it and developed rationalizations to justify its retention." They conformed with only the latter part of the confession:

> The better path I gaze at and approve,
> The worse—I follow.

Prejudice penetrates science, philosophy, religion, and all phases of mental life. Its well-nigh universality takes on some-

thing of the character of inevitableness. Yet the psychological drive creates no corresponding logical necessity. Though the holding of a point of view is necessary, it is not necessary to hold a given point of view, or to hold one to the exclusion of all others. We need not be one of those who, "having seen, believed, or believing that they had seen, refused to doubt; or not having seen, had met and talked with those who had seen, or believed they had seen or had met those who had seen". Liberalism calls for tentative attitude, for an attitude subject to change, "good for this day only"; prejudice is lack of plasticity. A tentative attitude decreases prejudice, for it replaces absolute with relative values. Experience, taste and predisposition influence the judgment and breadth of understanding decreases prejudice. To understand all is to forgive all if all should be forgiven.

"No one should ask the fish what is done in the plain, nor should the rat be asked what takes place in the water", declares a Yoruba proverb. But the fish philosophy is flavored of the life of the finny tribe, fishy, and that of the rat reflects an enhanced opinion of the righteousness of the rat community. How, then, shall we rid ourselves of tribal prejudice? In part, by often asking: "What would the great of past ages, if we could commune with them in some house-boat on the Styx, think of us and of our achievements?" By studying the genus man rather than the species Londoner, and refusing to bring our lame philosophy to a halt at the first turnpike gate. There is no help in Bryon's,

> You tell me to mix with mankind:
> I can not deny such a precept is wise;
> But retirement accords with the tone of my mind:
> I will not descend to a world I despise.

The prejudice felt by people of one social and cultural setting toward those of a markedly different one sometimes breaks down. The breaking down of culture limitations paves the way to the breaking down of prejudice, but while culture isolation is maintained, culture prejudice flourishes. When the bars are down and the culture comprises traits which previously were without its circumscribing circle there is an antidote to prejudice. The Sioux who understands something of our life and reflects upon it becomes skeptical about the values of his own culture. He now judges from two points of view, that of the exotic as well as that of the indigenous culture. When the new point of view enters, the values of the old life are no longer absolute but merely relative. The

culture is now seen to be little more than an historical accident. That which previously had appeared essential now seems incidental. The "essential" which is seen to be such by accident of birth or environment loses its irreplacable value, and smacks of premature generalization.

Among the Winnebago only after the introduction of new external elements was there objectification of the old tribal life, an estimation of its virtues and vices by another standard, the setting up of new culture ideals and new landmarks of progress. While the social and psychic life runs smoothly such comparisons are difficult. While the Jews rejected foreign ideas they entertained no liberal attitude toward things non-Jewish. As soon as the ideas of surrounding cultures filtered in a more liberal spirit took root and grew on the sustenance received through further accretions of ideas from other cultures. In the second and first centuries B.C. the ethical horizon of Judaism was enlarged by the introduction of new elements: the Persian influence in *Tobit*, the Greek influence in the Jewish Alexandrian literature and in the Palestinian work of *Ben Sirach*, the cross-currents of thought and the rivalry of sects. Among the Alexandrian Jews a broadening of the culture followed the varied contacts in a cosmopolitan atmosphere. "The Jews of Alexandria did not show the same literary activity during this period as their brethren of Palestine, or if they did their writings have not been preserved. But the fragments which have come down to us show breadth of ethical outlook, and the hope of universal moral progress, as might be expected of those dwelling in so cosmopolitan a center as Alexandria." Not until the first century B.C. is retribution viewed almost entirely from the standpoint of the individual, the national self-centered point of view being dominant up to that time. The individualistic point of view came only with conflict of opinions within Israel, with the setting up of diverging and ultimately conflicting points of view. The quarrels of the sects shattered the sense of national superiority. When the Pharisees came to regard the Sadducees as in a sense outside of the true Israel, a large element of culture prejudice disappeared. The *Psalms of Solomon*, one of the apocalyptic books of this period, traces the adversity of the nation to the sins of the Sadducees, but the writer depicts future retribution on an individualistic basis. Only in the *Book of Judith* does the emphasis still rest on the solidarity of the nation, and *2 Maccabees* restates the belief in individual retribution. Thus Jewish thought

is leavened with the yeast of other contacts: the periods of the greatest invasions by foreign thought are those of most rapid religious development. By the grafting of foreign ideas religion is reinvigorated, and bears fruits hitherto unsuspected. The more rapid the grafting, the more rapid the growth; thought grows by amalgamation, by accretions, as well as by the overcoming of difficulties. Judaism is but one illustration of changes which have characterized many civilizations. The civilization of Greece, once interpreted as a wholly endotic development, is now known to be indebted to many non-Grecian influences. Greece was receptive. She borrowed from Egypt, India, Phoenicia, Crete, the Hittites, and, some would say, even from Germanic tribes. It was so with Rome, and with every country which has attained prominence. Witness Japan and China, waking to new life when they borrow from other cultures and react to old traditions from a new standpoint.

"The position he takes up! That's the way of your intellectual fool, the universe over. He takes up a position, and he's going to be the most brilliant, delightful, engaging and invincible of gay delicious creatures defending that position you can possibly imagine. . . . We 'take up our positions', silly little contentious creatures that we are, we will not see the right in one another, we will not patiently state and restate, and honestly accommodate and plan, and so we remain at sixes and sevens."

Opinion is not equally free to express itself in the manner which logic dictates but is drawn hither and yon by many distracting forces. It is subject to custom and to the tendency to imitate; it conforms with the demands of education and habit; commonly accepted opinion has compulsive force; it produces a uniformity of conviction in all save the sturdiest minds, and even they are warped, or they bend to keep from breaking.

In closing, I can not refrain from the reflection that the above account of prejudice is probably mostly a mistake. If prejudice is as common an infliction as I have suggested certainly I must have a goodly share of it and my prejudice must have colored my treatment of this theme as the prejudice of others colors their themes. Yet I find solace in the further reflection that a prejudiced account of prejudice is inconsistently consistent with my theme; and that from you, fair-minded readers, I shall obtain an unprejudiced consideration of its merits. Perhaps you will agree with me

that all truth is relative, unless it be the truth that truth is relative. This, if I mistake not, is absolutely correct. And whether my interpretation is consistently inconsistent, or only inconsistently consistent, why have it as you like: what difference does it make? Only ponder the sentiment:

> "Through the distorting glass of Prejudice
> All nature seems awry, and but its own
> Wide-warp'd creations straight: but Reason's eye
> Beholds in every line of nature—truth,
> Immortal truth, and sees a God in all."

WHAT IS ABNORMAL PSYCHOLOGY?[1]

By J. W. BRIDGES
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ACCORDING to the statistical definition "abnormal" means deviating from the central tendency of a population. There is thus no dividing line between the normal and the abnormal. Various degrees of abnormality exist, but "abnormal" may be understood to designate the major deviations. This definition of the abnormal has been adopted by a number of recent writers on the subject; but they do not all hold consistently to the point of view and its implications. For instance, some of them urge the desirability of developing "normal" children. It is obviously not particularly desirable to be mediocre.

The statistical view of abnormality has a number of important implications. In the first place the abnormal includes the *supernormal* as well as the *subnormal,* since the deviations may be above, as well as below the central tendency. Genius is thus as abnormal as stupidity, exceptional memory capacity as abnormal as amnesia, and hyperemotionality as abnormal as deficiency in emotional responses. It is probable that the abnormal should also include, in addition to the supernormal and subnormal, a third category which we may call "paranormal";[2] for an individual may not only react very intensely or very weakly to a situation, but he may also exhibit an unusual or false reaction in that situation. Hallucination and paramnesia are examples of the paranormal. Strictly speaking, the paranormal may perhaps be reducible to the categories of very much or very little, but it is convenient, at least provisionally, to group this type of abnormality into a separate category of apparently qualitative deviations.

Secondly, the abnormal must not be confused with the *pathological* or *morbid.* The abnormal includes the pathological, but there are many abnormalities that can in no sense be regarded as pathological. These are merely idiosyncrasies, or marked individual differences, and represent constitutional factors of a non-

[1] Communication presented in the symposium on abnormal psychology at the Ninth International Congress of Psychology, Yale University, Sept., 1929. The paper consists for the most part of paragraphs from the writer's book on "Psychology, Normal and Abnormal", published by D. Appleton & Co., Jan., 1930.

[2] This hybrid word may be justified by its convenience and euphony.

pathological nature. These constitutional factors may of course be either inherited or acquired. Thus, extreme stubbornness is abnormal as well as catatonic negativism, peculiar mannerisms as well as the stereotyped responses of dementia præcox, unusual egotism as well as the delusions of grandeur of the paranoiac, marked grouchiness as well as epileptic ill humor, and in general any important deviation from the central tendency as well as deviations that are pathological in origin. The special branch of abnormal psychology which treats of pathological abnormalities is called psychopathology.

Thirdly, the abnormal must not be identified with the *undesirable*. Some abnormalities may be highly desirable, others may be undesirable. For example, genius is usually regarded as desirable, as is also exceptionally good memory, or keen sensory discrimination, whereas stupidity or marked forgetfulness are usually regarded as undesirable. The abnormal and the undesirable are really in no way related, in spite of the popular notion to the contrary. These conceptions belong to two different universes of discourse, the one scientific and the other ethical.

Abnormal psychology is thus the study of all extreme deviations from the norm or central tendency. It is related to the psychology of individual differences since it treats of the more marked differences. It includes but is broader than *psychopathology,* which is the psychology of morbid abnormalities. Psychopathology must not, however, be confused with *psychiatry.* The latter is a medical specialty, an art or practice based on various sciences, as well as upon personal experience in handling and treating patients. Psychiatry is more inclusive than psychopathology. It involves the study of all the symptoms of mental disease and defect, physical as well as mental. Biochemistry may contribute as much to psychiatry as psychopathology does. Psychiatry also includes the treatment of mental diseases and the care of the insane. Psychopathology is merely the psychology of the disease, the description and explanation of the mental and behavior symptoms. It is concerned with the physical aspects only in the same way and to the same extent as general psychology is thus concerned.

Abnormal psychology is obviously not educational science, ethics, or social philosophy, yet it is not always clearly distinguished from them. It has nothing to do with the good and the desirable, nor with the aims of education and social service. It is primarily a pure science but like general psychology may be

applied in various fields of human activity to improve the "means" but not to determine the "ends".

It is important to distinguish between abnormal psychology and *medical psychology*. The latter is the application of psychology, normal and abnormal, to the medical problems of prophylaxis, diagnosis, and therapy. This application may be made in any field of medical practice but especially in psychiatry.

Abnormal psychology must therefore be distinguished from *mental hygiene* which is concerned with the application of psychology to the problems of prophylaxis. Mental hygiene is a recent development in the field of preventive medicine. It is primarily a movement whose object is the promotion and preservation of mental health. It is thus a part of the public health movement. Its chief task is the education of the public in those scientific principles and practices which have a bearing upon mental health. But mental hygiene is also the art of handling and correcting various minor problems and maladjustments, which interfere with happiness and well-being, and which may lead to more serious forms of mental disorder. Its object is not only to prevent mental disease and defect, but also to promote the development of the best possible type of personality. It therefore seeks to encourage scientific investigation into all the factors, hereditary as well as environmental, that cause not only mental disease, mental defect, and delinquency, but also unhappiness, inefficiency, and other undesirable conditions.

Abnormal psychology must also be distinguished from so-called *clinical psychology*, which is an application of psychology, normal and abnormal, chiefly to the problems of diagnosis. Finally, abnormal psychology must not be identified with *psychoanalysis*, which is in part a psychological theory and in part a diagnostic and therapeutic method. Psychoanalysis has made a contribution to abnormal psychology but it is not coextensive with it.

THE PERSONALITY SYSTEM AND ITS SUBSTITUTIVE REACTIONS[1]

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IF WE assume that the patterns of activity through which the energies of the personality find expression can be viewed as a system, the significance of any element can be ascertained by subjecting it to conditions which modify its customary form of expression, and give rise to substitutive reactions throughout the system.

One of the difficulties in the way of personality research is that serviceable categories for the description of the personality as a whole are still largely wanting. The substitutive reactions of a system cannot be satisfactorily studied until a means has been found of stating the system as a whole before the substitutive reactions are invoked. In despair at the myriad difficulties of the problem, academic psychology has tended to evade the issue and to concentrate attention upon the minute exploration of detached aspects of the system. The clinical psychologist has never been able to evade the responsibility for summing up the personality as a whole, because he has been compelled to make important decisions about the future of the personality as a whole. The psychiatrist must continually decide whether John B. or Mary C. will, if released from rigorous supervision, commit suicide, rape or murder, or adapt smoothly to the realities of family and professional life. The clinician has found it imperative to search for signs which have high predictive value in relation to the gross adjustments of the individual.

Discarding specifically pathological terms, the personality system tends to be considered by psychiatrists and especially psychoanalysts as a constellation of the following action patterns: somatic reactions, autistic reveries, adjustive thinking, and object orientations. That the personality may truly be considered as a system is exemplified by the fact that substitutive reactions which

[1] The present writer has elsewhere criticized the existing personality records. See "The Problem of Adequate Personality Records: A Proposal," *The American Journal of Psychiatry*, May, 1929. This paper is designed to develop an affirmative point of view toward personality problems.

implicate in greater or less degree all of the other categories of activity may be produced by interposing changes in any one of them.

Suppose we pass in rapid review the facts which the four terms are designed to indicate. The somatic reactions at any given cross-section of the personality are striped muscle movements and tensions, heart and circulatory reactions, gastrointestinal responses, skin adjustments, organic sexual behavior, respiratory, pupillary and urogenital adaptations, inner glandular action on the biochemical balance of the blood, heat production (fever and certain metabolic alterations not included before), electromagnetic conductivity, and immunological responses. Under the same environmental conditions, individuals show wide variations in physical behavior, and where these manifestations show certain gross deviations from norms, though no organic lesion can be shown to be present, the presumption is that the energy of some mental process has been converted into somatic form. This notion of hysteria (and what may be called hysteroid reactions) was classically formulated by Freud. Every individual who is closely scrutinized shows, from time to time, tendencies to urinate excessively (though no adequate physical explanation is possible) to refrain from passing feces, or to suffer pains in the back or the head.

Autistic reveries are nonadjustive to reality. They may be divided into several classes, of which morbid-suicidal, pessimistic, megalomanic, denunciatory and persecutory reveries are particularly common. In exaggerated form, they become the most conspicuous feature of the personality, and various clinical names are used to distinguish among them. Common, and representative, themes are suggested by these quotations: "I'm a hopeless sinner", "The world's going to the dogs", "I'm the slickest guy in the world", "The President is the Judas of Mankind", "The President is using death-rays on me". Autistic thinking flourishes in greater or less abundance in every personality whose history is taken for any length of time.

Adjustive thinking has to do with the relationship of the individual to reality. It issues in socially relevant acts, which on the creative level mean contributions to science, art, administration and philosophy. Autistic thinking is highly egocentric, but adjustive thinking, when it dwells upon the relationship of the self to its surroundings is able to treat the self as an object among objects.

The object orientations of the individual person are describable as various degrees of assertiveness, provocativeness or submissiveness toward sexual and nonspecifically sexual objects in the environment. In extreme instances the individual may be abusive, insulting, domineering toward superiors, colleagues, clients and subordinates in his profession, and toward his wife or mistress or homosexual object in his intimate life; or he may be cowed in his work and timid in his sexuality; or he may show extreme variations between his professional and private levels of behavior.

The personality system may be assessed, then, at any given cross-section in terms of its patterns of physical reaction, autistic revery, adjustive thinking and object orientations. This classification carries with it no specifically pathological connotations. The extent to which a personality with a given constellation of physical, autistic, adjustive and object orientations is to be called "normal" or "abnormal" depends upon the statistical mean of action in specific situations, or upon some more or less arbitrarily chosen definition which seeks to "transcend" cultural limitations. Pathological categories criss-cross the terms used here. One may refer, for example, to the distinctions made by Franz Alexander between a neurotic symptom, a neurotic character trait, a psychotic symptom, a criminal act, and a perversion.[2]

Comparisons between one personality system and another can be made on the basis of the substitutive reactions which appear when they are subjected to the same conditions. This may be illustrated on the gross level by referring to some of the "experiments" which society has tried. Mr. A, for instance, is a member of a city council in one of our largest cities. On two occasions, when he was defeated for reëlection, he developed autistic reveries to such a degree that he was confined in a sanitarium under the care of a psychiatrist. When a new election came around, the hope of reëlection induced relevant thinking, and he took the steps necessary to secure his return to power, to collapse again when defeated. Characterizing Mr. A's personality bluntly, it may be said that political activity was a substitute for neurosis (at least! One physician thinks he is psychotic). Mr. B, who lost out in his campaign for the legislature, began to worry about his health and, though no adequate physical basis was discoverable, devel-

[2] *"Der neurotische Charakter", Internationale Zeitschrift für Psychoanalyse,* XIV (1928):26–44.

oped a host of gastrointestinal disturbances which incapacitated him for regular professional life. Political activity was a substitute for hysteria. Mr. C, who lost his administrative position, ceased any sort of professional activity and took mistresses and prostitutes, indicating that his object orientation and his thinking in the political field was a substitute for his object orientation in the sexual field. Mr. D, when defeated for Congress, quickly transferred to the practice of law, showing very light depressive and accusatory reveries. Object orientation and thinking in politics was, as far as his personality was concerned, no more than one alternative orientation among many nonspecifically sexual objects.

These rather glaring instances of drastic substitutive reactions perhaps serve the purpose of casting into high relief the essential conception of personality as a system which may be readjusted by tampering with elements of the system, and bringing out adjustments of value in comparing one personality with another. From this point of view, the problem of personal investigation is to discover how most economically to expose the reactions which will enable one to predict the substitutive reactions which will arise in personalities under specified (and socially significant) conditions. Prediction may also be retrospective, in the sense that we may use certain present signs to indicate that the personality has met some of its earlier crises in definite ways.

The prolonged interview as a method of studying the personality system and its substitutive reactions has been most highly developed by Freud, of course. But its possibilities for exact prediction are poorly explored at the present time, due to the inadequacy of interview records. I want briefly to indicate why the prolonged interview, when properly reported, can contribute greatly to personality research. As the interview develops, the subject undergoes a long and carefully scrutinized series of personality readjustments. For instance, if the analyst at a certain stage provokes the subject to insult him during the interview, the following are among the reactions which may occur in the subject during the immediately ensuing twenty-four hours:

He may develop a headache, gastrointestinal troubles, or some other physical manifestation.

He may find that his sleep is interfered with on account of self-critical (morbid-suicidal) reveries for having verbally assaulted the analyst; or he may show other autistic material.

He may quarrel with superiors in business or with his wife, or show other significant alterations in his object orientations.

He may show a burst of creative thinking.

The analyst, taking such facts in juxtaposition with others, may be able to predict the kind of substitutive reaction this person is likely to show in a whole range of social situations, and to predict retrospectively the form of reactions which he manifested in his early experience. The trained psychoanalyst watches the subject like a hawk for clues of this nature; the possibility of removing his "hunches" from the realm of art into the area of dependable knowledge depends upon the development of adequate records, and the checking of predictions.

It is implicit and partially explicit in what has gone before that we want dependable knowledge of two kinds about personalities. One way to state the matter is to say that we want "developmental" and "reactive" predictions. These terms are not to be considered as exclusive, but are to be interpreted in the light of the procedure by which the generalization is made. Developmental sequences are those which are typically followed by personalities who pass through a given social milieu. In certain societies infants are not weaned until they are three years of age, while in others the weaning occurs at the end of the first year. Children are subjected to sucking and biting deprivations at different times, and probably in different relation to demands for urethral and anal sphincter control. The "deep analysis" has laid much stress upon the rôle in personality development of the pre-genital crises, and it is worth examining the possible changes in personality development from one culture to another which are due to the differences in the order of the demands made upon the infant and the growing child.

The developmental sequence would, schematically speaking, take some such form as this: Individuals who meet crisis A with pattern A′ are likely to meet crisis B with pattern B′ . . . ; individuals who meet crisis A with pattern A″ are likely to meet crisis B with pattern B″ . . . The crises may refer to modes of weaning the infant, controlling its bowel eliminations, breaking it of infantile masturbation, and so on. If we find that C is playing a certain dominant rôle in a like-age group at twelve (controlling by bullying), we ought to be able to predict that he has greater or less chance than D of retaining a dominant rôle in such a like-age group with the changed activity pattern which appears in various cultures at fourteen. Charlotte Bühler, in observing the first social reactions of infants, detected children who dominated through pressure of activity, despotic behavior and "leadership"

behavior.[3] What is the probability that those who reveal a particular activity pattern will be more or less likely to assume certain rôles in subsequent infantile, childhood, adolescent and adult situations? What is the value of psychoanalytic records taken at different ages and under different conditions for the establishment of the developmental patterns of the culture? To phrase it differently and more pointedly: What is the degree of correlation between results obtained from such records, and results obtained from other kinds of personality records?

Developmental sequences (predictions), though valuable for a great many purposes, are partially invalidated as they are made on account of the changing cultural patterns of societies like those of Western Europe and North America. The purposes of intensive control are better served by what we have named "reactive" predictions. The developmental prediction states that a personality who has met one situation in a certain way has a certain probability of meeting another subsequent situation in a specified way, but it does not undertake to deny that factors A, B . . . might be introduced to modify this reaction, through the interpolation of a new situation between the ones previously described. Reactive predictions can thus be used to break down cultural and even ordinary physiological probabilities.

An advancing psychoanalysis will devise interview and accessory procedures which will short-cut the interventions to be made in the personality system for the sake of predicting and controlling its substitutive reactions. Perhaps hysterical reactions can be removed in given cases by altering the metabolism more economically than by interviewing procedures. An interesting commentary upon the intimacy of "mind-body" relationships (upon certain dispositions toward substitutive reactions) is the common experience of analysts that compulsion neurotics (who show exaggerated types of autistic thinking) begin to react hysterically as the analytical process continues, and that hysterics (who show many bodily symptoms) show obsessive formations as they relinquish their bodily symptoms.

Before concluding these observations it may be worth remarking that, although the prediction of one set of tangible reactions from another is the aim of scientific formulation, this by no means implies that the "stimulus-response" type of thinking is the one best calculated to guide the attention of the thinker to the selection

[3] "Die ersten sozialen Verhaltungsweisen des Kindes," *Quellen und Studien zur Jugendkunde*, Heft 5, Jena, 1927.

of the most fruitful hypotheses ("If" predictions). Indeed, especially valuable results are secured in the personality field by the pattern of thinking which views a cross-section of facts as an expression of a few "tendencies".

The main reason why the tendency style of speculation is useful is that the phenomena which are discernible at any given cross-section are inexhaustible. If the observer tries to enumerate all the body movements, all the electronic gyrations, all the nuances of social adjustment which are thinkable in a given constellation of personality events, he is likely to become lost in aimless classifications, and to prove barren in inventing procedures calculated to elicit particular aspects of the whole which may be of high predictive value. The human mind is able to operate with a very small number of categories with which to introduce order into events, particularly when these are, for the most part still defined qualitatively. Clarity of thought demands economy in the orienting objects of thought.

How a tendency conception may lead to fruitful search for predictively valuable particulars is shown in the case of Freud, in contrast with Janet. Janet made remarkably clear classifications of the psychopathological facts as he saw them, and although his terms and categories were abundant, his work was comparatively sterile of novel procedures for the modification of human personalities. Even his classificatory pursuits were hampered by his little criticized assumptions. His notion that dreams were passing confusions which were traceable to diminished psychological tension in sleep deprived dream material of all significance as classifiable data, and he almost completely ignored it. Freud, who tended to operate with a few bold tendency simplifications, brought into the range of observation whole categories of data which have high predictive value.

Tendency interpretations may be divided into five main classes, depending upon the relationship between the terminal situations selected and the cross-section of events which is interpreted.

1. Personality events may be interpreted as approximations toward, or realizations of, goals which are communicated by the subject. "I'm running for Congress"; "I'm elected, and my life's ambition is achieved". If the person is interviewed about himself for many hours, spread over days and months, we may become more and more confident that the individual is achieving objectivity in the communication of his life goals.

2. Personality events may be interpreted as degrees of approxi-

mation to subsequent events, which are actually observed. Mr. C's solicitude for the health and welfare of the needy ones in his district may be interpreted in the light of his subsequent campaign for Congress.

3. Personality events may be interpreted as degrees of resumption of terminal situations of a type which have already been observed. ("Regression")

4. Personality events may be construed as approximations to "normal" terminal events which are observed for the biological or cultural category of the individual. Thus heterosexuality may be postulated as a tendency of a human being who consummates no heterosexual adjustments.

5. Personality events may be interpreted in terms of end-situations which are "extreme" for the members of the species or culture. Thus the acts of man may be viewed as degrees of approximation to murder, suicide and incest.

The psychoanalytical modes of interpretation are fertile in tendency interpretations which can be usefully applied to personality problems. The terms ego, super-ego and id may be used to summarize the structural aspects of the character. Both the theory of neurosis and of criminology has been enriched by the application of the concept of a "self-punishment drive" by Theodor Reik and Franz Alexander. Among the non-analytical terminologies, the four-fold wishes of William I. Thomas have performed valuable service. The long inventories of supposed instincts are less at fault because they imply an unwarranted assurance about the innate propensities of man than because they are "too numerous to mention", and introduce confusion rather than orienting principles in the field of interpretation.

SUMMARY

The personality is a system which, when interfered with at any point, shows substitutive reactions which may be compared with the substitutive reactions of other systems. Generalizing useful categories of summation from psychopathology, the personality system may be treated as a constellation of somatic reactions, autistic reveries, adjustive thinking, and object orientations. The prolonged interview is a mode of altering the personality system which is particularly useful for the formulation of developmental and reactive predictions. The tendency style of thinking is well-calculated to guide the observer to the selection of fruitful hypotheses in the field of personality investigation.

A CRITIQUE OF "CONTRIBUTIONS TO ANALYTIC PSYCHOLOGY."[1]

REVIEW BY LYDIARD H. HORTON, PH.D.

THE pronouncements of Dr. Carl Jung may be counted on to arouse interest among students of personality chiefly because of the historic part he has played and is still playing in operating his Zürich "school" as a sort of damper upon the exaggerations and the dogmatism of the Vienna psychoanalysts. Fifteen years ago this tendency became manifest and led me to call attention, in the JOURNAL OF ABNORMAL PSYCHOLOGY, to "Jung's courageous recantation" as a former literal follower of Freud's methods. This commendation was occasioned by his rejection of fixed symbols in the interpretation of dreams. But it was then argued that Jung was doing something more portentous than merely to protest against Freud's *reductive method*, with its all too simple reduction of human endeavor to obvious motivations like hunger and sex: in parting company from Freud, Jung was running into self-deception through the use of a so-called *constructive method*, which seemed to rival the free and easy dream interpretations of a Joseph and a Daniel.

Now the present volume reveals very patent unfoldings of Jung's thought along both these lines. His protests against Freudian "reductions" are concrete, positive and sensible, while just in scientific spirit; whereas his own "constructions" are not sharply defined, being often verbally ambiguous. As a result, Jung shows himself to be a practical mystic, using methods hardly germane to modern scientific exposition. He offends through reasoning too much by analogy, but is disarmingly modest in his new profession of a certain know-nothingism about the nature of human consciousness and—what is highly symptomatic—about the interpretability of dreams. He abandons the magisterial psychoanalysis from the heights of which he once severely reproved Dr. Morton Prince for disagreeing with Freud about dream symbolism. He gives fresh measure of credit to Prince and Janet. On the whole, the contributions are colorful presentations of his own

[1] Published by Harcourt, Brace & Co., New York, 1928. Pp. 400. $5.50.

special vocabulary of musings over the psychic vestiges of primitive human mentality, as hunted out in the thought-processes of his patients. In this pursuit he has gone so far afield as to identify in Americans the manners of negroes and the souls of Indians!

In his present expansive mood Jung is much more likable and more comprehensible than in his earlier Freudian positivism. He now appears like a genial host intent on persuading us of the palatability of rather heavy dishes of anthropology and demonology by flavoring them with the fine spices grown of a warm spiritual outlook. The educational urge dominates all his "constructions." The diet he advocates is his theory of inherited instincts and derivations therefrom, such as an abiding faith in *archetypes*. The latter look suspiciously like "inherited ideas", archives, as it were, of ancestral experience.

In richness and length, as well as in solemnity, Jung's table of contents calls to mind those banquets of university corps students that one runs into at Swiss hotels: the earnest young men trooping into the dining-room, wearing pill-box caps, black braided tunics, doeskin breeches and Bismarck boots; the whole picture enriched by splendid bouquets held in rams' horns, symbolical of plenty. They gather to do honor to their organization, and welcome their elder members for the revival of tradition and *esprit de corps*. Similar, no doubt, in purpose and sentiment, if not in paraphernalia, must have been the reception given to Jung amid the goodly company of the Analyzed when he originally presented this material in his own tongue, now translated into English in this volume of 400 pages. The contributions are variously dated from 1919 to 1927.

The first thing that strikes the eye is the pièce de résistance, seventy pages long, "On Psychic Energy". It lies before us on the groaning board with a certain splendor and impressive unity, like a stag roasted whole for a celebration. As from time immemorial the antlers of a stag have recalled the quarry won, the dangers braved and ardors past, so this formulation seems to symbolize the triumph of the Zürich School over the vicissitudes of its chase after the ultimate meaning of the Unconscious. This effigy of the Libido or Concept of Psychic Energy looks like a complete Einsteinian formulation, although conveniently carved up for consumption into chapters and sections, appetizingly inscribed: "The possibility of measuring psychic quantity", "The conservation of energy", "Energism and dynamism", "The trans-

formation of libido", "Symbol making", and other labels that must be seen in their places to be duly suggestive. Curiously enough, the title of the last section is "The primitive concept of libido". This label fitly describes the substance of this trophy of the hunt. The entire booty is game from the prehistoric anthropological wilds even though now dressed and served in a style ostensibly befitting the era of after-dinner speeches on psychology.

In making display of this booty, Jung indicates that he has attained the object of his quest; he has at last brought home his game, the mysterious entity that he has so long professed to be trailing in its dream world by the track of its symbols, now called archetypes. He must have penetrated its protean disguises, for now the proof graces a banquet of ideas; here it is served up "quantitatively" and offered as the authentic embodiment of psychic force, of Bergson's *élan vital*, of Aristotle's *hormé*, of human striving in general.

A careful inspection of this chef d'oeuvre shows that it is not the real thing. It is a reproduction by the "constructive method" of the Freudian libido concept which came to America twenty years ago.

Jung has made it over into something less sexual, as befits his wider, more matured view of human motivations. What Jung is really announcing by this new display of old material in a refreshing rearrangement is that libido now more than ever means psychic energy in the broad sense of Aristotle's energeia (the exercise of faculty). He aims to describe it in modern scientific terms. We must either say that he fails completely in his assumption of a quantitative viewpoint or assert, as he himself did long ago of some dream too literally interpreted by the Freudians, that "symbolical not literal meaning must be attributed to the phantasy." And it is a phantasy based on Freud's concept of an undefined "displaceable energy."

Certainly it is not meat to feed the scientific mind; for Jung's would-be "quantitative" description of the libido must be regarded as a pseudoscientific construction. Its biology makes one think of the composite picture drawn by men of the stone age in the Cave of the Three Brothers, "It has the horns of a stag, an owl-like face, ears of a wolf, tail of a horse, and the feet of a man. It seems to symbolize strength, fleetness, keen vision, and wisdom." (Fossil Man in Spain. Yale Univ. Press.) Of this wishfully-designed chimera, as of Jung's similarly conceived concept

of "psychic energy", it may safely be said: There never was such an animal, there never can be such an animal.

This latest formulation is trimmed with analogies based on the conservation of energy, on Carnot's cycle in thermodynamics, on the "quantitative measurement" of emotion attempted by galvanometric studies, on "energic values" attaching to ideas and on archetypes which are supposedly archaic impressions derived from the remote past through our instincts. But the synthetic product seems to me as chimerical as the many-virtued quarry of the Cro-Magnon cave artist. Contrastingly, it was while occupied with these constructions of Jung that I attended a series of round-table discussions conducted by eminent workers in the study of basal metabolism, food calorimetry and in other precisely treated problems of human energetics; and, although thus predisposed to welcome any extension of valid quantitative thinking to the concept of psychic energy, I can hardly say that Jung introduced me to any such. He fails to connect with the modern science of energy and achieves anything more novel than Aristotle's concept of energeia, the exercise of faculty. Yet Jung is resourceful in striving to re-hash this old idea so that it can be palatable to a generation that reads about the discoveries of modern physics in the breakfast newspapers. In spite of this, his effort On the Concept of Psychic Energy remains as a whole positively pre-historic in tone. He has found no true measure, nor yet calibration, of psychic quantity. He has searched for the formula of psychic energy in the wrong universe of discourse. He brings back only picturesque analogy.

While succumbing to the verisimilitude of analogies between thought and energy he indulges in an archaic type of reasoning which impresses upon us the perennial allurement of that thinking.

It is not inconsistent with this conclusion to say that Jung is at his clearest when he describes the primitive conception of the libido and assumes—alas, gratuitously—that his own conception is other than primitive. But if we call the libido of Jung merely an impression or illusion of quantity-in-mental-power, we shall find illuminating affinities between his concept and those of primitive man.

Citing McGee on *Wakanda*, Hetherwick on *Mulungu*, Jung says: "Especially valuable is the observation that a concept like that of *manitu* occurs also as an explanation of any astonishing experience." (p. 71)

Many of Jung's own "explanations" are of the same eclectic character, as for instance this: "We cannot escape the impression that the primitive conception of *mana* is a pre-stage of our [Jung's?] conception of psychic energy and most probably of the energy conception in general." (p. 75)

To be right about this statement, Jung should qualify the *our* so as to speak for himself and the adherents whom he has trained in his symbolism; truly, certain concepts of the Zürich School would appear to be lineal descendants of prehistoric thinking. Jung's entire volume appears as a lawyer's brief, a pleading for the legitimacy of the Dawn Man's working hypothesis about the mind. But we cannot allow Jung the license he takes to forget that the physicists of the seventeenth century permanently endowed the word *energy* with a special definition and that their concept has become standardized according to gauges, the tolerance of which allows no room for the ill-assorted concepts that Jung is trying to fit in to the framework of science. Why try to reinstate error? That he should attempt to rehabilitate the *mana* concept by camouflaging it as *libido, élan vital* or *hormé* suggests that his "psychic energy" can have no scientific acceptance from any laboratory standpoint. His "quantitative" arguments are prescientific analogies; they are subjective word-paintings more suited to the impromptu, inspirational talks of a lay preacher than to any established context of kinetics, dynamics or energetics.

The questionable sources of this synthetic chimera of the Energic Concept of the Libido, reveal themselves among the telltale fragments of thought that are scattered throughout the much less pretentious essays and lectures that compose the remainder of this revelatory opus. There we shall see how the "kick" of association by contrast, which so fascinated primitive mentalities and played such a large part even in Aristotle's thinking when he got beyond his depth, serves to supply C. G. Jung with the inspiration for rather superfluous dichotomies: dynamism is contrasted with energism, animus (male soul) with anima (female soul), container with contained (feminine), personal unconscious with collective unconscious. Through the popular success of his extrovert-introvert distinction, Jung has evidently been led to capitalize the discovery that a stick has two ends.

"Spirit and Life" introduces us to another twin-concept. It is a good little vesper sermon on what Aristotle called energeia. Jung adumbrates the nature of the psyche (the energies of which

he would fain quantitate) when he says: "It consists of record-images of simple brain processes, and reproductions of these images in an almost infinite series. These images have the character of consciousness." (p. 81) But, it seems, consciousness is a quality conferred by "association with the ego" and things psychical are conscious only if they fall under the rays of the search-light called consciousness. Again, analogies predominate.

The best that can be said for Jung's highly involved expounding of these terms is that it does point waveringly to the way of getting more life-ruling power out of the "spirit" (p. 95) by searching with the beams of conscious insight more widely. Such is the work of a man thinking aloud, groping for a psychophysical formula. Its merit is of the same genre as Emerson's Over-Soul and conveys the same message that we can profitably seek to enrich our lives by gaining access to unfamiliar regions of the spirit. But Jung's appeal to physiological knowledge only confuses the discussion. He says here nothing more than Freud had said in "The Ego and the Id" three years earlier.

"Mind and the Earth" (pp. 99–140) is a diffuse but earnestly fumbling presentation of Jung's personal doctrine of "archetypes." These may be conceived as the vestiges of man's mental evolution on earth, ranking in Jung's ambitious parallel between physics and psychics on a par with the stratification of life-zones in the rocks, or, better, with the layers of artifacts in the floor of a cave-dwelling. One can see that he is toying with the doctrine of inherited ideas, although he professes (p. 157) to have set it aside. Yet, so far as he is clear on "innate ideas" he holds to the view of Descartes, that the general shape of human thought, in the genesis of the individual, has a certain uniformity because we are constituted by heredity as we are. Be it noted, Descartes disclaimed the exaggerated theory of "innate ideas" still attributed to him. But Jung abuses the idea. The following passage of Jung shows by what syllogistic sleight of hand he has scrambled the doctrine of innate ideas into a mess difficult for any modern science to stomach: "Although our inheritance consists in physiological paths, still it was mental process in our ancestors that created the paths. [*A premise full of ambiguity.*] If these traces come to consciousness again in the individual, they can do so only in the form of mental processes; and if these processes can become conscious only through individual experience and thus appear as individual acquisitions, they are none the less pre-existing traces which are merely 'filled out' by the individual

experience. Every 'impressive' experience is such an impression, in an ancient but previously unconscious stream-bed." p. 61) Freud had reasoned similarly in "The Ego and the Id", in terms equally out of harmony with modern anthropology, which discounts "inherited ideas".

This theory of ancestral vestiges permeates "Mind and the Earth" so fully that for Jung any local environment is a watershed which mysteriously irrigates its inhabitants with characteristic thought-reactions, called archetypes as if they were ancient deposits. The individual stream of thought is fed from the "collective unconscious". He carries this so far that he confidently discovers ". . . the mysterious Indianization of the American people. I recognized this secret only through treating many Americans analytically. In comparison with Europeans extraordinary differences were revealed." (p. 136)

It is essential to introduce here a sobering appeal to fact. According to studies in the Cartesian Research[2] covering thousands of closely analyzed dreams, there is not one per cent of dream images which afford the slightest reason for surmising the presence of ancestor-built memories. Still less is there any reason for deriving them transcendentally from a collective unconscious as if the archetypes were like disembodied experiences that had become caught in the landscape and were apt to rain down and filter into the personal unconscious. Yet Jung chooses to carry his thoughts forward in this style. With words untinged by any premonition of intellectual downfall he says: ". . . the American presents a rare picture—a European with negro manners and an Indian soul! He shares the fate of all usurpers of foreign soil." (p. 139) And to clinch this idea, he adds: "Certain Australian primitives assert that one cannot conquer foreign land, for . . . the strange spirits will inhabit the new-born. There is a great psychological truth in this."

Does it not seem that this criticism is false to the text and to the structure of Jung's argument? But no, I have gone over many times the chain of ideas involved in this archetype concept and still find at every point the same mystical rendering of more or less commonplace phenomena of anthropology and social psychology. There seems to be no suspicion in Jung's mind that his concept of ancestral archetypes is superfluous (on the principle of parsimony of causes) so long as he finds that similar thought-

[2] Conducted by the Cartesian Research Society of Philadelphia, incorporated 1920.

forms (equally called archetypes) can be transferred *by culture without blood-relationships.* This he notes in respect to the working of the "collective unconscious" in America. (pp. 136–137)

By what warrant of experience or experiment with individual human beings does Jung set down his discovery of these archetypes or thought-forms of two kinds, the one derived from atavistic memory and the other from the collective unconscious? The answer is to be found in the now somewhat inconspicuous and faded background of Jung's dream studies, made in accordance with the "constructive method" and never so clearly and impartially painted as by Wm. McDougall in his "Outline of Abnormal Psychology". I venture to say that these suppositions about archetypes survived with Jung because they had proved useful in classifying and "explaining" certain phenomena of dreams that eluded analysis. A hypothetical derivation from the pre-individual past seemed to ease the situation of the interpreter. But it did not explain enough; so recourse was had to another source of derivation, the contemporary fund of ideas called the collective unconscious.

The appeal to fact shows the non-scientific character of such devices of explanation. When the observation of a dream is made sufficiently intensive and extensive, its fabric can by a "reconstitutive method" be accounted for in terms of individually acquired experience. The arguments in favor of either variety of archetypes are seen to mutually cancel out of the picture and there is no need of any primitive libido to show how the dream items were incited. But such a simplification of the inflated equation by which the constructive method expresses the relation between thought and things would deprive Jung of one of the most valuable privileges he has earned by his philosophy of mind. It is a privilege which he brilliantly defends, that of regarding ideas as a kind of ambiency, instead of getting down to the minutiae of brain records in the way I have described in "Prince's Neurogram Concept".

This is error; but we should recall the dictum of Voltaire, "L'Erreur aussi a son mérite". Thus we find valuable by-products in Mind and the Earth: the elaboration of Lévy-Bruhl's empirical concept of the *participation mystique,* as between primitive man and environment (p. 112) and, more importantly, between parents and child. Of course, the whole thing could be boiled down to a behavioristic concept of rapport as illustrated in the training of "mind-reading" horses, but that would take something of the

poetry and suggestiveness from Jung's thesis,—so long as horses are not known to react by telepathy. At any rate one prefers to leave "Mind and the Earth" unimproved by rationalistic corrections while taking thought with Jung of the realm of the beyond where ideas are atmospheric and ambient.

We are brought back to earth when Jung analyzes very unconvincingly a man's dream of being bitten in the heel by a snake. (pp. 103–107) It gives him occasion to say: "The serpent motive is certainly no individual acquisition, for snake dreams are frequent enough, even among city people who may never have seen a snake."

It does not seem to occur to our theorist that the mere drawing of a snake is adequate basis for an animated serpent dream without recourse to the remote past—as the reconstitutive method can readily show. But since Jung does invoke ancestral origins, it is strange to read in the article "Analytic Psychology and Weltanschauung", "Do not fear that I shall speak to you of inherited ideas. Far from it." (p. 157) This is only one among the abounding contradictions in Jung's work, showing lapses in scientific definition. The archetypes would seem to occupy a disputed twilight zone between "inherited ideas" and instincts. Certainly, no clean-cut distinction between these three concepts is achieved. Jung's archetypes are laid in a No Man's Land where he can be Mr. Facing-Both-Ways.

Again we must appeal to fact. Where does Jung find the archetypes? He seems to admit that he gets them from dreams. But we note that the quality of his dream analysis, impaired by untenable notions of serpent symbolism, is such that it cannot inspire any confidence. The factual basis of his archetypes is largely conspicuous by its absence. Nevertheless this pet notion of archetypes does serve as a catch-all to collect rather interesting fruits of observation. Thus he gleans material that enriches his own "Analytic Psychology and Weltanschauung" beyond anything dreamed of in Freud's philosophy. He picks out many real ingredients in personality missed by Freud. Allegedly, Jung finds origins of infantile development outside the boundary of individual experience, in ancestral memories and in the collective unconscious. Having thus gone out of bounds, he comes back with "Analytic Psychology and Weltanschauung" loaded with hints to appetize the study of instinctively biased reactions and intuitive malapperceptions of the gropings of the untrained mind seeking to

embrace reality. He illuminates the subject of mental trial and error in phantasy; but he scorns to rely on such standard psychological terms as I have here used to pay a tribute to his infinite variety. "Woman in Europe" (pp. 164–188) is a discourse less keen and far reaching than we might expect. It lacks piquancy and does not seem to be inspired by much first-hand knowledge of the new woman in action, which is the real problem under discussion. What an opportunity missed to show the libido at work driving a golf ball or a motor car! He shows better information in "Marriage as a Psychological Relationship", since this topic is nearer to the clinic and belongs to family life and unreformed traditions rather than to woman's new and unfamiliar fields of action. The high point of this essay is his rendition of the socratic-platonic idea of husband and wife being mutually complementary. I confess lack of zest to follow the labored antithesis between container and contained in emotional rapport; but there are some rather noble passages that distil a flavor of high ideals.

The "Love Problem of the Student" helps to give to flirting and hence to courtship that recognition that Freud has so conspicuously and so undeservedly denied to it. This is another example of the much needed enlargement afforded to the Weltschauung of the Analyzed. What stays in one's mind is the pondered discussion of the homosexual problem. He seems to exaggerate the normality and tolerability in education of the homosexual rapport between teacher and pupil. Like Edward Carpenter in his book on the Third Sex, Jung seems to have missed the distinction between the romance of true male fellowship and its sex-tinctured varieties. This is a remnant of the blindness engendered by gazing too long at the sexualized libido of Freud's "Three Contributions". Here, as everywhere in the book, this influence is traceable; the real man, Jung, trying to regain the vision impaired through his Freudian adventures.

The essay on Poetic Art (pp. 225–249), while diffuse, is notable for breadth of view on two significant points. The first shows a dawning realization that Janet's theories of mental level are finger-posts to the true nature of psychic energy. The second significant point is that some kinds of art deserve to be called symptomatic rather than symbolical, being—as Jung says with an effect of sarcasm—expressive of influences that "might conceivably be left without injury or regret to the Freudian purgative

method". (p. 245) We shall see in "Abreaction" (p. 282) how he impugns the larger pretensions of the cathartic method.[3]

"Belief in Spirits" is the gem of the book. It is as refreshing as a rum sherbet at a heavy dinner course. For once, in this representation of the "ghost-making" process, the poetic license that Jung everywhere takes with "psychology" appears to be justified by its results. He manages to erect a *frappé* of explanations about the spirits out of supposed crystallizations of archetypes. One expects the reasoning to melt away at any moment, but somehow it holds together and affords insight into the constructions of folk-lore that the myth-making propensity projects up through the ages. "Spirits are unconscious autonomous complexes that appear as projections because they are not associated with the ego." (Which seems to mean that they ". . . . are not consciously linked with the thought of origin from oneself".) In some sentences, the art of suggestiveness proves richer than the restrained dicta of pure science. At least, he conveys to our intellectual palate a pleasant sense that we are imbibing the *raison d'être* of the spirit world. We also obtain the essential flavor of Jung's own "constructive method", the active principle of the way he has come to think about life. Starting with the bizarre and puzzling contents of mentality as observed in dreams and in the fancies of dementia præcox, he has learned to apprehend them as manifestations of a pervasive entity which is also responsible for ghosts. This, the symbolizing libido, is as honestly come by, although as unreal in fact, as the "de-phlogisticated air" of Joseph Priestly. Let us hope that, unlike the eminent but unwitting discoverer of oxygen gas, Dr. Jung may live to see the day when the ghosts which he so brilliantly accounts for in terms of a spurious entity may be given a more correctly bio-psychological formulation, even though the result be less deliciously titillating to one's sense of the ghostly. As it is, his rationalization of ghost phantasies can be reversed in its terms, at many points, showing a certain double-jointedness in the articulation of his thoughts. For instance this: "Our intellect is born from mythology and mythology is nothing but a translation of inner experience into the language of pictures. Thus spirits are transformed into mind." (p. 267) The ambivalence is here

[3] Incidentally, we may look for a rapprochement between Janet and Jung through the disillusioning discovery by the latter that the score card of mental performance is not to be drawn up from the formulas of physical energetics, but rather, as Janet would admit, from the artist's standards of esthetic accomplishment.

manifest: existing myths are presented as a cause giving shape to the intellect; conversely, myths and mythical beings are effects of a process indistinguishable from intellection. Out of the endless circle come spirits . . . and the intimation of the ambiency of ideas. Why, we may ask, does he not simplify the explanation in standard terms like apperception, delusion and phantasy, or by discriminating between individual errors of thought and social imitation? The answer is that to picture ideas as a sort of ambiency suits the author better since it enables him to continue his thinking about the "collective unconscious" as a reservoir of myths and about the circulation of "psychic energy" as a shifting of a something-or-other that is neither mental nor physical. "When an individual dies, the psychological attachment of his relatives' feelings is cut off. The attachment represents the application of a certain quantity of psychic energy. When the application of this energy becomes impossible through the death of its object, there remains only the idea or image of the dead. The energy is now applied to this image, and when the attachment has been intense the image is vividly animated and forms a spirit." (p. 267)

As examples of the flexible terminology that is the life of the "constructive method" this reasoning is magnificent, but it is not psychology. And the author has no right to say: "I have given you an outline of the spirit problem from the standpoint of modern psychology." There is nothing modern about his deductions, especially as he explains at the end why he has ". . . purposely avoided the question whether spirits are real . . ." (p. 268).

"Instinct and the Unconscious" (pp. 270–281) is decidedly *not* an "investigation" as it is called on page 66. It is only the stirring of a pot full of obsolescent concepts, with a spoon borrowed from St. Augustine—this being the provenance of the term "archetype". Well may the author say that "since Descartes and Malebranche this metaphysical concept of the archetype or idea has continually decreased in importance". Indeed, he ought to recognize that Science has appropriated the word to new uses, by right of eminent domain; it now means a type-image or class-concept covering, in biology, a group of related species. Jung uses it as "archaic idea" rather than in the sense of ruling features of a class-concept. That enables him to say without violating etymology: "The collective unconscious consists of the sum of the instincts and their correlates, the archetypes." For these,

Jung offers as ". . . the most striking evidence . . . the intrusion of the 'collective unconscious' into the conscious, as occurs in all paranoiac and hallucinatory psychoses".

Such discoveries may safely be said to be mythical as well as mystical. They are real only as part of an apperception mass of the Zürich School. They are errors of observation, susceptible of quite satisfactory rectification in terms of real psychology; for the alleged "intrusions" are easily accessible to a revision of the "constructive" interpretations. The worst aspect of the latter is now seen, however, in the fact that young physicians in hospitals for the insane are inclined to adopt the "collective unconscious" without critical inquiry. Such is the swing of the pendulum back from the extreme skepticism of twenty years ago.

As it stands, the archetype notion is an intellectual fugue, an escape into phantasy from the dilemma of instinct. "I am convinced that from the psychological standpoint the problem of instinct cannot be treated without a consideration of the archetype problem, because at bottom it is the same. But I find it somewhat difficult to discuss these questions, as opinions about the rôle of instinct differ widely." (p. 276) Naturally, he cannot separate them, seeing that his favorite words *archetypes, categories, intuitions, instincts* are all mutually involved in fallacious definitions, holding over from medieval thought. Jung's own treatment of archetypes will not clear up the question, for his various definitions tend to contradiction. The best statement he makes about archetypes is that they are "typical forms of apprehension: . . . uniformly and regularly recurring ways of apprehension". Their entanglement in his mind with the pre-individual past must be viewed as a relic of his Freudian "conditioning", in Pavlov's sense.

Less confusing is the discussion of "Psychological Types". (pp. 295–312) It is a warming up of an old savory; its principal ingredient being Dr. Jung's extrovert-introvert antithesis. Yet he calls it the latest problem of analytic psychology (p. 312). Is it not rather true that the question of types is the staple pudding of all psychologies because it gives everyone a chance to put in his thumb and pull out a plum and say: "What a big boy am I!"? Discussions on the subject are usually inconclusive; temperaments differ infinitely but opinions about them fall into a few classes so that the vaunted "validity of judgments" even when attested by correlation mathematics is mostly a matter of error agreed upon. We all enjoy experiments with sorting people into classes,

even if we remain immeasurably far—as we are now—from anything like a scientific conception of types. "Extrovert" and "Introvert" are fashionable terms to-day. That gives the Zürich menu of psychology an éclat comparable to that obtained by Alfred Adler's school through his "discovery of the Inferiority Complex"—as the American newspapers have it. Mere vogue seems to prevail over science in giving importance to these terms.

The array of four lectures on "Analytic Psychology and Education" shows how far Jung has diverged from his former beliefs about psychoanalysis. Yet it is only fair to say that Freud had already, two years earlier, started to retreat from the position that Jung attacks in these lectures.

In Lecture I, he attacks the exclusively sexual theory of the neuroses (p. 313). He reaches out for a psychology of the ego, which ought to bring him alongside of Rank and the new Freud (p. 318). He introduces as if it were a novelty the reëducation principle, so long maintained by Morton Prince, in contrast to the idea of simple purgative treatment by psychoanalysis. A very common sense view is taken of the child as primarily a dependent being, thus marking the essential meaning of the change from childhood to adult life. But, in this veering toward common sense explanations, Freud had preceded Jung—(Ego and Id).

The importance of dreams for studying human behavior is not overlooked nor overstressed; but the author is unnecessarily sketchy in the presentation of specific instances. A mountain climber's dream of "stepping off into space" is cited. This had been treated by Dr. Jung as prophetic, in the sense that it led him to warn the dreamer that he was unconsciously seeking death in the mountains. The latter did soon find it in the Alps through a step into space. The coincidence demonstrates nothing—unless it be the partiality of the Zürich School for reading dreams as "prospective". The internal evidence of this dream shows me—according to my study of similar oniric images—that the dreamer experienced a simple levitation illusion in sleep, due to physiological reactions that were empty of wishful significance. Such gratuitous imputations of meaning may be regarded as characteristic of the "constructive method" and as belonging to the practical mysticism that I would respectfully impute to the leader of the Zürich School of Analytic Psychology.

Ralph Waldo Emerson has characterized the exaggeration of the significance of signs to which the above criticism alludes: "It consists in the mistake of an occasional and accidental symbol

for an universal one." Of course there is some relation between all the different forms of behavior of an intact nervous system but the connection is not so simple that a dream can be confidently interpreted on the basis of the simple formula employed in the above case—the formula of oniric wish-phantasy. Before Jung can be regarded as having made his onirocritics conform to the standards of scientific caution that are praised in his lectures, he would have to give proof of more rigid checking of his data about archetypes. Again, in the words of Emerson: "Let us have a little algebra instead of this trite rhetoric—universal signs instead of village symbols—and we shall both be gainers." (The Poet.)

This is not say that mysticism, and especially practical mysticism, does not have its place in applied social psychology, of the kind that Dr. Jung is delving into. Some subjects, like ethics, have to be taught upon before anyone can pretend to a positive science of morality; but the foundations should be laid scientifically. Now Jung precisely fails in this particular: he builds a theory of dreams and of archaic instinctive brain records almost before he has really examined the structure of dreams and certainly before he has grasped the biological facts about dreams that have been accessible to observation for thousands of years. Hence, the sketchy analyses of dreams, leading to untenable notions about the alleged intrusion of the collective unconscious into the conscious and other notions that Dr. Jung has tried to coördinate through his Concept of Psychic Energy. Yet to do justice to him as a teacher, it should be said that his energic concept appears to fill the office of a memorizing device aiding him to pigeonhole quickly the observed peculiarities of his patients. It enables him to "tag" them by imagining them to be transformations of the libido. People with a certain turn of mind can do this advantageously. And in the light of such associative preferences, we can understand the "analytic" formulations of Freud and Jung, and also understand the tenacity of their devotion to them. These are systems that, pragmatically speaking, work as provisional devices of notation and interpretation. From this standpoint we may value Jung's "energic concept", regarding it with the tolerance that history accords to Priestly's de-phlogisticated air. But we cannot accept Jung's libido as a legitimate product of scientific induction, any more than Freud's.

The transformations of the analytic doctrines are changes of the Weltanschauung on the part of practical analysts. Inasmuch

as they are making history in their own field, they do not always take due heed of the history of science. Dr. Jung, himself, has pointed this out in the past and his present work would indicate that his interest is attaching itself to classical ideas of Descartes, Janet and Prince, and that his formulations of theory are shaping themselves to conform to general science. The "energy concept" is an obvious effort in this direction, like the "emasculated Eros" of Freud.

The captious might quarrel with the exordium of the second lecture (p. 329) to the effect that "Psychology is one of the youngest sciences. The name 'psychology' has been in use for a long time." As point of historical scholarship the exact contrary is easily defensible. "Psychology" was a new and strange word in the seventeenth century and very little used until the nineteenth century. On the other hand, Aristotle's Essays on Dreams written three centuries B.C. are examples of analytical achievements constituting a part of psychology quite as truly as Jung's present onirocritical doctrines. Nor should we omit to mention that Jung, himself, gives considerable scientific credit to Artemidorus of Daldis who wrote ages before the term psychology was invented. (p. 390)

While we may respect Dr. Jung's experimental work on the significance of "association time" in the study of emotional complexes, his general grasp of the history and methods of psychology has not been hitherto firm enough to keep him from being overinfluenced by Freud. It is significant of progress that Jung now says: "I do not believe that the last word about the dream has been said by Freud."(p. 331) He justly describes dream-study as the foundation of psychoanalysis. We have no need to dispute this. The source of both the true and the false in the two "analytic" schools can be found in their system, or lack of system, of their onircritics.

Obviously, an up-to-date psychologist should beware of unmethodical dream readings. In these lectures Dr. Jung utters specific warning to this effect. Yet, discussing neurotic children, he falls back upon his characteristic free and easy methods when analyzing the dream of an epileptic boy. The outcome of this analysis is left as inconclusive as the issue of the attempted therapy. (p. 337) Perhaps this is excusable on the ground that the topic of the functional character of some epilepsies is still too controversial to bear expounding in detail.

More to the point are the clinically verified conceptions of

Jung—with which my own experiences entirely agree—that many neuroses of children are rather symptoms of the parents' mental condition than a genuine disease of the child. Of course, the doctrine must not be carried to the point of dogma, nor does Jung do so. But in the United States it would be pardonable to exaggerate its importance as an aid to the publicity campaign for the "training of parents" started over twenty years ago independently of psychoanalysis and only now attaining appreciable momentum. The Vienna theories of child psychology, as Dr. Jung implies (p. 393), have only retarded this development by obscuring the biological fact which he now brings out with commendable artlessness, to wit: that the child is essentially a dependent being, while the overrated Oedipus and related complexes that Freudians take so seriously are described as dangerous metaphors. This is balm to the stripes inflicted upon those of us who dared to say the same thing twenty years ago. There are a goodly number of similar admissions in the concluding sections of the "Contributions".

Lecture III calls Freud's work "a psychology of the ramification of the sex-instinct in the human psyche". Jung speaks wisely of the need of balancing one instinct against another. (p. 343) His growing eclecticism is illustrated when he says: ". . . it may happen that we have to explain a certain individual on the basis of Freud's theory before the wedding, and afterwards rather according to Adler, which common sense has done long ago". (p. 345)

Thus he indicates that these authors have found only fragmentary aspects of human adjustment. For himself, he earns a bigger place in the sun when he says: "Immense damage is done to the feelings through the Freudian doctrine (*of sex*) while it is just through decent feeling, and through this alone, that we can hope to advance towards the solution of the sex problem." (p. 347)

One would think he had never had anything to do with lending authority to Freud!

The qualities of Jung, the man, now begin to show above the blanket of the old analytic methods, like an edelweiss piercing through the melting snows. His common sense asserts itself against the older Freudian views in these words: "It is altogether wrong to assume that whenever a (*mental*) content is unknown it is necessarily repressed." (p. 349)

This lecture shows that in his rapport with patients Jung, the man, lays stress upon ethics and economic realities regardless of the trammels of analytic theory, which disciples of Freud, like Otto Rank, still find embarrassing. Jung, to-day, is the pragmatic Swiss pastor looking after his psychological flock and refusing to be limited by the conception of wish-fulfilment. Innocently paraphrasing R. W. Emerson, he exclaims: "Learn your theories as well as you can, but put them aside when you touch the miracle of the living soul." (p. 361) Thus spoke Emerson in defiance of the phrenologists of his day; thus now speaks the Zürich leader in defiance of the similarly "bumptious" Freudians. Even the serpent symbol in dreams is bereft by Jung of its fixed Freudian meaning, although he is still a bit cocksure in supposing its true meaning to be *fear* on the ground that "man has an instinctive fear of snakes". Has he failed to hear the loud protests of behaviorists against this assumption? Would he not do well to let his skepticism apply to archetypes and alleged "dream symbols" and put *them* aside?

In lecture IV he again opposes Freud's old view of repression in the theory of the unconscious. (p. 363–4) He repudiates the "well-known Freudian absurdity—art and religion are nothing but substitutes for repressed infantile sexuality". What is left of this class of dogma he sweeps away almost in the language of Descartes: "You should be careful . . . not to attribute an adult's psychology to a child." (p. 369) Yet this vicious practice has gained not a little ground in America through the early propaganda sponsored by Freud and Jung when they were closely associated.

If Jung's explanation through *participation mystique* (p. 374) of the unconscious misdirection of children by parents should gain the force of a warning and be heeded, it might compensate for the harm done in America by Freudian dogmas of a supposedly natural sex rapport between parents and children as in the Oedipus and Electra complexes. Yet Jung's revulsion against this Freudism does not prevent him from giving a reasonable amount of attention to the dangers of similar influences in family relations.

There remains serious danger to common sense lurking in Jung's "constructive method" of dream-analysis, with its still fantastic and near-Freudian belief in dream items as symbols. (p. 375) A reversal on these points is coming to him—and he will be broad enough, we cannot doubt, to adjust himself to this

fate. Meantime his formulation of "psychic energy" remains suspect, as also the unreal distinction between "collective" and "personal unconscious" which is based on two supposed varieties of archaic ideas. Moreover, like Freud he has been deceived as to the part of heredity in forming archetypal images owing to having become overimpressed by "the astonishing analogies between mythology, on the one hand, and dreams and delusions, on the other." (p. 368)

In "The Significance of the Unconscious in Individual Education" he momentarily forgets the mystic aspect of the unconscious while writing about collective education—the application of rules, principles, methods to building a collective nature. What he serves to us is a pleasant demi-tasse, sugared with sensible educational ideals. But there are grounds in the coffee; unpalatable assumptions about archetypes, collective unconscious and symbols. For the hand that brews "analytic psychology" is still shaken by spasms of the Freudian disease and hag-ridden by the chimera of the Energic conception of the libido. Let us hope that this is but an aftermath of a subsided fever of theorizing and that Dr. Jung will shake off the residual obsessions about "psychic energy" as he has many another unsubstantial entity emanating from the Vienna School.

On the whole, the "Contributions to Analytic Psychology" reveal their author as a man who has by no means stultified his ability to readjust his conceptions. A careful study of the excellent index, topic by topic, would repay the reader and would make it clear that Jung has gone a great deal farther than Freud in abandoning the original ground taken by the two schools of "Analysis". The index shows that Jung's range of thought is extensive and that many of his observations would appear more in line with modern psychology if they could be lifted out of their unfortunate contexts of a mythical libido and an impossible collective unconscious.

The Banquet of Dr. Jung for the Analyzed affords good food for the mind only if one is wary as to which pieces to accept and which to reject.

BROKEN TENSIONS: AN INTROSPECTIVE ACCOUNT OF A CONCUSSION

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THE following fragment has been lying amongst forgotten papers for the last eight years. It is printed here precisely as it was pencilled in the first place, except that I have omitted a few details in the first part of the story, which had been inserted to show that I was oriented, have altered some proper names, have spelled out contracted words in full, have inserted a few explanatory phrases in square brackets, and have permitted a few trivial changes in punctuation.

[Sunday] May 15, 1921—5:27 P.M.

Last Friday afternoon I saw a boy in my office—Morris Davis [a patient]—then saw Miss Y who brought M. R. with her to greet me, then went to faculty meeting. Talked after the meeting with Fogler, spoke for a minute with Forbes, then came home. Started to blacken my shoes preparatory to seeing Mrs. A. B. C., a new case, in the evening. [I was doing this on a back porch.]

I got my shoes nearly finished. In fact, I put on and polished one coat and then put on another. Then I leaned for a moment against the rail. I think I was standing holding on to rail with left hand—know I was facing the back of the lot. Rail—a single 2 x 4—gave way (nails not holding at the front end—behind me) and I fell on my head and left shoulder upon the ground below. A lower strip parallel with the 2 x 4 held my feet on the porch, so I could not use them to save myself.

I don't know what happened when I fell. I think I remember going down, but not striking. Prima [my daughter] was in the kitchen and says I called out (or called her) with a queer kind of a call—but I don't know when I called her. She says also that she heard the noise of the fall but didn't know it was I falling so she didn't go at once. I don't know whether she came to me as soon as I called or not. She says that when she came I was kicking my legs in a queer way. I don't remember it. She says she asked me if I had broken any bones and I have a faint recollection of moving each of my limbs to see, and I have some

sense of lying there with my feet towards the back of the lot—perhaps nearer the porch than my head. But I have not verified this. I have a dreamlike vision of Tommy, the D. K. E. butler [from the house next door] standing in his white coat and of a light-haired boy back on the Deek walk merely looking at me. I spoke to Tommy—probably later—and know that I called him by the wrong name, probably—the name Jim keeps coming to me, but I think that is wrong. I am trying to think of Whitelaw's name—yes, Bob. Prima or Melissa [my wife]—it seems more like Melissa—corrected me and said Tom, and I remember that later Melissa—possibly Prima—expressed thanks to Tommy and to Mr. Talbert too. Jack Talbert. They say he was there and I have a vision of someone standing there stiffly with black eyes—a face that seemed, somehow or other, to be the face of Morris D., whom I had seen earlier in the afternoon.

I don't know how I got from the ground to the bottom step (or the next one). Probably Tommy and Prima managed it. But I remember in a very dreamy way Tommy in front of me to the left—his presence rather than any special vision of him, and perhaps his voice suggesting a drink of water for me. Prima got a glass. I think the glass was really a jelly glass (not flaring out), and I think I remember taking a sip and setting it down, as though on a chair in front of me and a little to the right. I think T., towards my left, expressed satisfaction at my taking the water, though it didn't give *me* any.

Something was said about ammonia (arom. spirits), and they gave me some, though I don't know when or how. I have a vague, dim and uncertain sense of Prima saying to mix it with water, or put it in the water, and possibly something about its being stirred.

I don't know what happened after that, though I suppose this is where the gratitude to Tommy and Jack come in. The next thing I remember is being in my room upstairs brushing the dirt out of my hair and choosing one of my own military brushes, instead of a more elegant silver-handled brush to the right of them on my bureau. I have a picture, not very clear, of some of the bristles on one side of one brush being dirty, with dirt out of my hair, but don't know—my eyes are getting heavy—some effort to keep them open—whether I noticed this at the time of brushing or later. I think that either Melissa or Prima said something about lying down and I think that the brushing was preparatory to it. My left shoulder is stiff. I guess it got

a good deal of the shock. I think that I may have meant to lie on my own bed but that one of them said I could lie on the couch downstairs if I wanted to—I have some sense of the brushing fitting either. I have not verified those dirty bristles.

The next I know I was downstairs on the couch, taking pains to have my head well raised by the rounding arm of the couch, to avoid congestion.

On the couch I was very much occupied with something that had happened. My right hand or fist seemed to be on a board like an ironing board which sloped upwards. I have a sense of striking, or having struck it, and somehow or other there was a problem solved or nearing solution. I think it was a way out from disgrace, that it had something to do with counting and with holes—black holes—in a mouth here and there where teeth had been. There was a sense of splashing, though no sense of water, or of newspaper cartoon stars in connection with my hand on the board. The board is wider than a 2 x 4.—I have been closing my heavy eyes. I want to stop and snooze or day dream. 6:25. There's Fowler [a colleague and close friend of the family] downstairs.

On the couch it was important to find out what problem [I] had been solving (At the faculty meeting we had talked about the budget, or rather Fogler had read a prologue to be read to the trustees on the low salaries, a prologue that had some good points and some bad ones, and I had talked to him about it afterwards, and know now exactly what had happened).

But on the couch I was very much detached from those things. Prima asked if she should call up Mrs. A. B. C. and say I couldn't go, and after Melissa urged it, I said yes. It comes back clearly enough now, but when Prima called her up it seemed so queer to me that I ever had been going—ever had had the great desire to go and straighten her out and work up a practice. Everything before the fall seemed very distant in time and very unreal. There was a gulf between me and them and I wondered if I really had talked with H. Y. and M. R.—if H. Y. really did say she'd like work in the college—if M. R. really was there—if I really did introduce them to the boy and then sit afterwards talking to H. Y. about the other boy, who has been thieving. It was hard to believe, then or later, that only a few minutes before Miss H. had called me up about getting my last lecture manifolded for the class. My talk with Fogler might well have been a dream, and so might a talk with Forbes after I left Fogler. I saw him

in a queer sort of way and remembered something about bifocals (he asked me if they bothered me). But on the couch he was a queer picture and there seems almost to have been something chromatic at the edges about the glasses he wore. Then Secunda [a married daughter] called up, or Prima called her up, and I said "I had forgotten that I had a daughter Secunda". There was a certain shock of surprise when she was mentioned, as though a kind of permanent rapport with her had been broken and then reëstablished.

Such things alarmed me a little. I didn't want to develop a continuous amnesia—I had read of a woman in Janet's book who always knew the past but never the present, and had never quite understood the case—couldn't empathize it—but I seemed to be like that—and I wanted advice from a neurologist. Asked them to call up Stone or Ravitz (who lived nearer). They suggested Thomson. I said he'd talk a great deal and I wouldn't know whether he knew or not. Melissa said there was no danger of my going crazy and I explained that the men I wanted (not sleepy now) were neurologists, not psychiatrists. So finally Prima called Stone, and I went to the phone and talked to him. I think I talked sense though I don't quite remember what I said to him. He replied that the symptoms all pointed to a concussion, not a hemorrhage, told me to go to bed, that he would call my daughter, Prima, in the morning, or she could call him and that he hoped to hear then a very favorable report. Prima had told me that he said he couldn't leave his office until ten or eleven that evening. So I went to bed. But I wanted Melissa to lie down beside me because the world was slipping from me and I wanted something to tie to. She was going to lie down on my Morris chair near the bed, but that wouldn't do. And it wouldn't do for her to lie down in her clothes so that she could go to the door, etc. For that meant that I'd lose her and I couldn't go to sleep without her there to keep me in touch with reality. She was unwilling at first and when she left me to open the door for Professor Fowler, I was angry. She wanted to "command the situation"—to be prepared for emergencies. I wanted to be constantly assured I was in a real world. So she lay on or in my bed. I remember asking her once or twice if I had really talked with Dr. Stone. She says I asked it "fifteen times". I think I clung to her pretty tight, and once or twice I clutched her when I had a dizzy attack. (I had had a day or two of them a month or so before.)

About 2 A.M. I heard a window open. It was Prima, who had moved from one room to another, and after some discussion about the source of the sound, all three of us talked about the sounds that had wakened Prima. I told Melissa she could go to her own room—I didn't need her any more. I slept soundly the rest of the night, and during the disturbance in the night, I had been pleased to notice how real it all was. I was really alert about noises, an unusual light on the neighbor's wall [our porch light was going], etc. I know I was better.

Yesterday morning, Saturday, Fowler came in to see me and I asked him if J. C. had really sat like an old man with a bright color on the lower part of his face. He said "Yes", though his description of the color did not make it as marked or as clearly defined as I pictured it. We discussed Fogler's proposed prologue to the budget, agreeing entirely about it. I told him how dreamy real things had been seeming to me—Melissa calling about supper, 7:05—and he said it was usually the other way, wondering whether things you had dreamed or thought of doing had been really done.

After he went I told Melissa that he seemed to be entirely gone so soon—he was gone and forgotten when the next thing happened.

This was only one example. Things in the immediate past have a present tension—they are not like things you date in a more distant past. But with me this tension didn't last—my mind was simpler—more of a one-track affair—"gone and forgotten" was the rule.

And as things passed away I have (or had) a curious sense of their being off to the left. So things and events kept running off and out of my life as they never had before.

Got to go and eat—11:12. [7:12?]

Here ends the manuscript. The story as I read it now contains details that I had forgotten. But I have never forgotten that strange, distressing break with a world of active interest and endeavor, the clinging to my wife as a bond with reality, and how relieved I felt when I found in the night that once more I was carrying my accustomed load of care for the safety of the house and family. In the course of eight years the dream of working up a practice has dwindled away quite normally with the attainment of a better financial position and the development of larger responsibilities within the university. As to the urge

to avoid disgrace, which came to whatever surface there was in the daze right after the fall, I recognize it now as something carried from early childhood. The mouth with the missing teeth I cannot explain.

A kindly student, who heard me read this tale, suggests that the title is wrong—it was not a case of concussion at all, but "just pure funk".

What a similar blow would have done to someone else, or what it would have done to me at some other time, I do not know. And so I can not say how much of this experience should be charged to the physical concussion and how much to the nature and history and momentary condition of the patient. I can only say that I have had worse blows on the head (one of which in childhood caused a serious congestion of the brain); that once on a dangerous mountain path I was green and beside myself with fear, though I soon recovered and made the passage unaided; that I have had my share of difficult situations in life; but that this was the only time in sixty years when I have been dogged with such a sense of lost rapport. The thing that stood out was not fear in any ordinary sense of the word, it was not loneliness as an adult feels it, and it was not the sense of being lost; for all these things imply a tension, a dynamic sense of relatedness to something you fear, something you miss or seek—a stretching toward or from them—and here the trouble was that the tensions and stretchings just were not there at all or wouldn't stay.

If there is any moral to this simple tale it seems to me to be the folly of trying to construct a psychology, normal or abnormal, that ignores purpose-like tension as about the deepest thing in life.

THE CONCEPT OF "EMOTIONAL AGE" AND ITS MEASUREMENT

By C. OLIVER WEBER

I. EMOTIONAL "INSIGHT"

THERE is no longer a possible doubt of the fact that instincts are modifiable. Like intelligence, memory, perception—in fact, like all *capacities,* they evolve in time. Indeed, the facile manner in which instincts appear, develop, alter and perish is the chief argument which leads some writers (Kuo, Faris, Kantor and others) to challenge their reality. But, if the instinctive and emotional factors of human nature exhibit *growth,* then why not establish age levels of growth? Already mental age, school age, physiological age, overshadow in importance the ancient conception of chronological age. We wish, in the first part of this paper, to defend the validity and practicality of the conception of "emotional age", which rides, so to speak, on the waves of the new and world-wide awakening of interest in the subjects of instinct and emotion—in Rousseau's "natural man". The special symposium held in England on the relation of instinct and intelligence, the international symposium held at Wittenberg college, and the appointment of a special committee of the American Psychological Association to survey its problems, are ample proof of the engrossing interest that exists regarding the life of impulse.

Let us exhibit some of the plausible contrasts between the conceptions of emotional and mental age. The victim of low "I.Q." gets lost in intellectual matters. Is there not a parallel phenomenon of what one might call "affective amentia", to be applied to the person who, because of emotional and instinctive immaturity lacks "insight" into social situations? Are there not some problems which feeling alone can solve? One might maintain with a goodly show of valid arguments that the life of impulse lies at the root of all *evaluations.* All the pursuits of the intellect rest upon the love of knowledge or the love of life, *i.e.,* upon *passion.* The intellect is driven by the fires of feeling. The love of truth drove Lamarck blind at his microscope, and drove Darwin to invalidism. Titchener speaks well of the martyrdom of science. We may be unwilling to accept the details of Bergson's

description of instinct as a mode of understanding, but are we not bound to grant that it is true in some sense? Ribot, too, writes of the logic of the sentiments. The mathematician Boole (founder of symbolic logic) notes the similitude of feeling to reason. He says that an emotion involves "an elimination of a mean term in a system which has three terms". This idea deserves exposition. Reason employs the syllogistic system of three terms. Reason brings two terms into significant relation because of their mutual relation to a third (the "mean") term. We arrive at the result that Socrates was mortal because both Socrates and mortality belong to a third term, humanity. Consider, now, the fear of death. Fear is a judgment, pronounced upon its object. Its logic, if written out, would run as follows:

All modes of death are fearful,
This is a mode of death,
Ergo, this thing is fearful.

Dewey apparently sanctions this view of the noetic character of the emotions.[1] The emotion, he says, carries a distinction of value—it is always "about" something. Normal spectators of the emotions of the insane often describe them as "objectless". But the person who feels the emotion tends to assume an object for it. He is "wrong", of course, but is it reason that tells him so? Does reason tell that hot iron is painful? No, fear of hot irons can only rest upon the experience of pain.

II. A TENTATIVE EMOTIONAL AGE SCALE

Whether or not the notion of "affective insight", will bear inspection, the fact remains that instincts and their accompanying emotions appear gradually, mature, and finally decay. There is indeed a cool, dispassionate callowness which often develops in the aged that puts them out of all touch (comprehension) with the warm passions of youth: this is the correlate of senile dementia. It is our immediate object to demonstrate that there are age levels of emotional response that can be detected by objective methods. To achieve this, a tentative emotional age scale was devised, given to 284 children in grades 4 to 7 (inc.), ranging in age from eight to seventeen years. The results indicate, moderately, as is to be expected from first attempts, that there is a real and measurable emotional maturation which correlates with mental age, physical age, chronological age, and school grade.

[1] Dewey, John: *Psych. Rev.*, Vol. 2, 1895, pp. 17–19.

Experimental.—The idea of the test was suggested by a reading of Burk's study of the collecting instinct in boys and girls. ("The Collecting Instinct", *Ped. Sem.*, Vol. 7, 1900, pp. 179–207.) This author found that the interest in collecting gradually intensifies, reaching its maximum at the age of ten. After this, it gradually wanes. To be sure, the "probable error" would be high if one assumed, that because a boy's collecting mania was at its best (or worst!) that he must be ten years years old emotionally. But, if he were rated on very many items of this sort, that represented all types of emotional response, we would attain an accurate gauge of his emotional age.

The discovery of several hundred responses that are known to wax and wane in a normal manner as age progresses, is no small task. We secured many suggestions for test items by sifting the literature, finding the questionnaire studies of Hall and the analytical work of McDougall of especial value. We emerged with a test embracing over 200 separate items.

The completed test, together with the Otis Group Intelligence Test (Form A) was administered to 151 boys and 133 girls in grades 4 to 7 (inc.) in two Auburn schools.[2] The number of cases of the ages 8, 15, 16 and 17 were so small that they had to be ignored.

As in the case of the erection of intelligence tests, the actual performances of the various age levels on each item were tabulated. In every case, this amounted to counting the frequency with which the cases of the same sex and age, favored a given response—such as fearing darkness more than poverty, deep water more than crime, etc., etc. Since the number of cases for each sex and age were always different, the raw frequencies had to be converted into percentages.

We were then ready to enquire, "How universal is the normal curve found by Burk in the case of collecting?" It was at once apparent that the bulk of the items did tend to give normal curves. That is, the percentages of children's responses to given items tended to wax and then to wane, as age progresses. For instance, the fear of thunder was exhibited by 33 per cent of the eight-year-olds, by 36 per cent at 9 years, 46 per cent at 10 years, 40 per cent at 11 years, 38 per cent at 12 years, 13 per cent at 14 years, and 44 per cent at 15 years. Only at the age of 15 is the normality of the curve violated. But, many of these inversions (to borrow a

[2] We owe a debt to S. L. Pressey and to O. R. Chambers for permission to use the age and sex norms established for the Pressey X-O Test. See especially the article by Chambers, JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY, Vol. 20, 1925, pp. 303–311, and the references there suggested.

term from psychophysics) were due to the fewness of the cases at the extreme ages of 8 and 15. There were but 6 cases 8 years of age, and 9 cases 15 years of age.

Some index of the average normality of the curves for the separate items may be gauged by counting the number of inversions. We counted as an instance of inversion every point in a curve where there was a failure to rise or to fall with each year's increase in age, according to the requirements of normality. The average number of inversions on all items was 1.57 for the boys and 1.49 for the girls. From now on, we assumed that the age at which the mode of the curve falls is the true age index of the corresponding trait. For instance, since the fear of thunder effects the largest percentage of children at the age of 10, the fear of thunder is scored as 10 years.

What about sex differences? Sex differences existed to the extent that separate stencils were employed in scoring the tests for boys and girls. It would be tedious to go into the details of the differences shown. Perhaps this would be a fruitful way of approaching the subject of the mental traits of sex. For instance, boys feared ugliness at ten, but girls felt it earlier: moreover, 20 per cent more of the girls felt it! In scoring the test, the items that showed three or more inversions were not scored at all. So also, we ignored all "weak" items, that failed to secure a good percentage at its mode. For example, no girls preferred to play with boys—here is no curve at all! Only 7 per cent of the boys preferred to play with girls. The remaining items were scored according to the age level at which they fell. Finally, the scores on the test were weighted in accordance with their apparent value as determined by the absence of inversions and by high modalities.

III. RESULTS

In addition to the scores of the emotional age test and the Otis test, we secured the school grade, chronological age, and physical age of our subjects. The Otis test yielded two scores a mental age and an "index of brightness", which is the measure which Otis employs to replace its rough equivalent, I.Q. Each grade in the Auburn system is divided into an A and a B section, involving promotion at mid-years. This gives us eight class intervals of school grade. Physical age was computed from the heights and weights of the subjects. Each subject's physical age was the average of

the age locations of height and weight according to the tables of Baldwin and Wood.[3] No doubt, this measure is approximate: we were unable to secure the X-ray indexes of bone development that find recent favor. Our interest in physical age was prompted by the general belief that instinctive and organic maturation go hand in hand.

The table below gives the correlations secured between these five variables, together with the usual attendant data:

TABLE OF CORRELATIONS

Variables Correlated	Cases	r	P.E.
1. Emotional age and mental age	231	+.422	±.036
2. Emotional age and index of brightness	229	+.023	±.044
3. Emotional age and chronological age	249	+.521	±.031
4. Emotional age and physical age	236	+.137	±.042
5. Emotional age and school grade	249	+.181	±.041
6. Mental age and index of brightness	289	+.176	±.038
7. Mental age and chronological age	291	+.070	±.039
8. Mental age and physical age	276	+.155	±.039
9. Mental age and school grade	290	+.142	±.038
10. Chronological age and index of brightness	293	+.007	±.039
11. Chronological and physical age	298	+.169	±.038
12. Chronological age and school grade	292	+.175	±.038
13. Physical age and index of brightness	279	+.023	±.040
14. Physical age and school grade	297	+.120	±.038
15. School grade and index of brightness	293	+.046	±.039

Nearly all of the correlations are low. The highest, No. 3, is open, in a sense, to the charge of being spurious, since in scoring for emotional age, we deliberately selected and weighted such items as indicate age differences. Still all scales, mental tests not excepted, are erected in this manner. The only disadvantage of the Otis test was that it was not adjusted to the chronological ages of our particular subjects. From the other correlations, within the limits of their P.E.'s, we learn that mental age is somewhat more closely related to physical age (+.155) than is affective age (+.137); *that emotional age is more closely related to school grade* (+.181) *than is mental age* (+.142).[4] More and more it is becoming apparent, through the work of such investigators as Pressey, Chambers, Murchison, Doll, Rosanoff, F. L. Wells, and others, that mental age is not by any means the most crucial measure for measuring success or failure, whether in intellectual or moral matters.

[3] Published by the Iowa Child Welfare Research Station.

[4] NOTE: The low r between mental age and school grade is no conclusive reflection on the Otis test. It is the practice of Mr. Barford to maintain regular promotion in his schools by giving special aid to failing students, by means of a system of visiting teachers. This modern and laudable practice, however, has the effect of lowering the r between intelligence and grade location.

Emotional age and mental age correlate to the extent of +.422. This seems an embarrassing result in view of our attempt to construct an emotional age scale that did not depend on intelligence. But the fact that two things are different does not prevent their interaction. Emotional maturity cannot solve logical problems but it can *drive* the intellect to do so. One cannot devise an emotional age scale that does not tax intelligence at all, but one can keep the tax on intelligence at a minimum: just as the factor of information is reduced but not eliminated in a mental age scale. That we secured the independence of emotional and mental age to some extent is indicated by the fact that brightness was practically of no aid in securing a higher emotional age score ($r = +.023$).

The device of partial correlation ought to aid us in determining the mutual effects of the three important variables, (1) emotional age, (2) mental age, and (3) school grade. From Table I we get the following r's:

$$r12 = +.422$$
$$r13 = +.181$$
$$r23 = +.142$$

From these r's of zero order we get the following partial r's:

$$r12.3 = +.402$$
$$r13.2 = +.128$$
$$r23.1 = +.007$$

SUMMARY

1. The view is defended that feeling may be construed as a mode of understanding; that emotional maturity makes possible the solution of problems of a social and moral order just as mental maturity makes possible the solution of problems of a rational (quantitative) order. Hence, the concept of emotional age is proposed for empirical verification.

2. A tentative emotional age scale, administered to 284 children, shows that a perfected scale of this sort may rival in diagnostic value, the traditional significances of mental age, school grade, chronological age, and physical age.[5]

[5] A revision of the test is completed. Sample copies will be supplied to all requests for them.

A STUDY OF THE SUPERSTITIONS OF COLLEGE STUDENTS

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IT IS generally believed that education reduces the superstitions and prejudices of any person or of any people. But this statement does not necessarily imply that well educated people are without such superstitions and prejudices. Several studies have been made upon this general topic. It is the purpose of this article to report a study of the effects of a course in general psychology upon some common superstitions and prejudices.

In order to test the changes that occur as the result of such a course, a modified form of a test devised by Nixon * was used. Nixon's test consisted of 30 rather common superstitions and prejudices. In his arrangement the lack of superstitions was indicated in answering the questions by marking each "false".

Because in some preliminary experiments it was found that some of the students, especially the better ones, discovered this fact and marked all the questions "false" even though otherwise they might have marked some of them "true", ten additional questions were added. These were statements of fact, eight of which were correctly marked "true". These were inserted in the Nixon list, making 40 items in all.

It is apparent from a survey of the questions that they are not a complete inventory of all the superstitions which any person is likely to possess. Rather it is a brief sampling of those which are of a more psychological nature. Furthermore a few of the questions are open to the criticism that they may not really represent superstitions. It is probably true that many psychologists might mark these questions true on the basis of fact. This problem will receive further consideration in a later part of this article.

Two groups of students were used in the study. One was a class of 103 students in general psychology in the College of Liberal Arts of Northwestern University. These were typical

* See Nixon, H. K. Popular Answers to Some Psychological Questions. *American Journal of Psychology*, Vol. 36, 1925, pp. 418–23.

sophomore and junior college students in a group where considerable selection and elimination had taken place. They were, therefore, average or slightly above average college students. The other group was a class of 46 students in general psychology in the evening classes of the School of Commerce. The majority of this group was of not more than freshman standing in college. As a group they were almost as good students as the Liberal Arts group. There was more range in ability in this group than in the Liberal Arts group. They represented the typical intelligent small executive and skilled worker. The one group, therefore, represents a typical academic student and the other an almost equally intelligent non-academic group. The Liberal Arts course in psychology was a three hour semester course; the Commerce course was a two-hour course.

The set of questions was given to each group on the first meeting of the class. They were told to answer the questions to the best of their ability. No further comments were made other than that they would be told about the test later in the semester. On the last meeting of each class the same set of questions was given again. No comments were made but the examiners circulated about the room as the students were answering the questions and any who asked were told that these were the same set of questions which they answered at the first meeting of the class.

These papers were scored by counting the number of the thirty statements of the Nixon list which were wrongly marked "true". The other ten questions of fact were disregarded in scoring. These scores, therefore, represent a measure of the superstitions and prejudices of these students. The following table gives the scores for each class at both the first and last meeting of the class. The grade which the student made in the course is also given in the table.

Several interesting facts are brought out in these data. First, we see that the superstitions of each class are less after the course in psychology than at the beginning of the course. Of course there was a time interval of about four months. During this time some of these students took other courses or did outside reading. Possibly some of them on reconsidering the questions changed their opinion. But it is safe to assume that the chief cause for a change in the replies to the questions was due to the study of psychology. Of course there is no evidence of just how seriously these students studied psychology. It is probable that they were about average students and spent on the average 40

TABLE I

SHOWING THE SCORES IN TERMS OF SUPERSTITION ON THE FIRST AND SECOND TEST AS WELL AS THE COURSE GRADE IN PSYCHOLOGY

LIBERAL ARTS CLASS

	First Test	Second Test	Psych. Grade		First Test	Second Test	Psych. Grade
1.	11	6	C	53.	6	2	A
2.	14	7	C	54.	11	4	C
3.	15	12	C	55.	6	4	B
4.	10	11	C	56.	9	4	C
5.	6	5	C	57.	13	5	C
6.	19	9	C	58.	15	12	B
7.	6	5	C	59.	7	7	C
8.	9	8	B	60.	16	4	C
9.	11	6	C	61.	14	5	C
10.	3	3	B	62.	7	4	A
11.	11	8	C	63.	12	6	C
12.	6	4	B	64.	16	6	C
13.	7	3	C	65.	7	2	A
14.	12	13	F	66.	9	2	C
15.	9	3	B	67.	6	3	C
16.	5	3	A	68.	14	12	D
17.	6	6	B	69.	10	1	C
18.	5	4	C	70.	10	6	C
19.	12	13	C	71.	11	9	F
20.	7	2	C	72.	4	2	C
21.	10	6	C	73.	10	7	C
22.	11	7	D	74.	16	13	E
23.	9	4	D	75.	17	4	C
24.	3	4	C	76.	13	7	D
25.	15	11	C	77.	21	15	F
26.	8	5	A	78.	20	3	C
27.	7	3	A	79.	6	6	C
28.	7	7	B	80.	3	2	C
29.	6	6	F	81.	11	9	D
30.	16	8	B	82.	6	3	F
31.	8	3	C	83.	8	4	C
32.	4	3	C	84.	7	5	C
33.	20	18	C	85.	11	14	F
34.	14	5	C	86.	7	7	D
35.	5	3	B	87.	3	2	B
36.	7	7	F	88.	5	2	B
37.	10	6	C	89.	11	7	C
38.	7	2	C	90.	10	8	C
39.	7	7	C	91.	7	9	D
40.	9	15	C	92.	9	5	F
41.	7	9	C	93.	8	7	C
42.	5	6	C	94.	8	4	B
43.	7	2	B	95.	16	12	F
44.	4	6	C	96.	11	5	A
45.	2	2	C	97.	6	6	C
46.	16	8	C	98.	15	5	C
47.	13	8	C	99.	9	4	F
48.	14	10	B	100.	4	4	C
49.	11	5	A	101.	2	0	C
50.	2	4	A	102.	14	4	C
51.	15	9	C	103.	5	2	B
52.	7	2	C				

EVENING CLASS

	First Test	Second Test	Psych. Grade		First Test	Second Test	Psych. Grade
1.	9	2	C	24.	12	8	D
2.	14	2	C	25.	13	8	C
3.	9	1	B	26.	5	7	C
4.	7	5	C	27.	15	7	C
5.	8	4	B	28.	13	6	C
6.	12	7	C	29.	18	16	C
7.	16	16	D	30.	7	2	C
8.	12	8	C	31.	10	4	C
9.	16	17	D	32.	11	5	C
10.	13	5	C	33.	17	7	C
11.	9	2	D	34.	9	8	D
12.	10	7	D	35.	12	5	B
13.	9	6	D	36.	16	17	D
14.	10	2	A	37.	11	8	C
15.	10	8	D	38.	9	6	C
16.	17	6	C	39.	11	1	C
17.	22	12	C	40.	11	4	F
18.	15	7	C	41.	10	7	C
19.	13	7	C	42.	12	5	D
20.	11	10	A	43.	19	6	D
21.	15	7	C	44.	15	6	D
22.	7	0	C	45.	13	7	C
23.	7	4	C	46.	13	3	A

to 50 hours outside of class during the semester in preparation of their assignments.

With the Liberal Arts students such study resulted in an average reduction of from 9.58 superstitions to 6.15 per student. This is a reduction of 36.8 per cent. The Commerce students reduced their score from 11.98 to 6.58 or 45.2 per cent.

From these results it appears that the evening class students had by far the larger initial superstitions and while they had only two-thirds as much class instruction their superstitions were reduced to not much above the level of the regular college group.

Readers will no doubt differ as to whether they would have expected a larger or smaller number of superstitions in either group or as to the expected effect of a course in psychology on these superstitions. It does seem reasonable to find less superstitions among the regular college group. They have been subjected to more instruction designed to overcome such superstitions. It is rather apparent that the course in psychology did have relatively more influence on the evening class group. This is not surprising to an instructor who has had several years' experience in teaching the two groups of students. The members of the evening class are not more intelligent nor do they as a group study more, but they take their courses more seriously. This is partly

because they are mature people attending this specific course because they believe it can give them something which they need. It is also because they have had relatively less college instruction and are more modified by the new type of education.

The scores on the test were correlated with the grades made in the course. Since the scores in the test were for the number of superstitions the correlations were all negative. The correlation between the first test score and scholarship for the Liberal Arts group was —.22+. Between the last test score and scholarship it was —.40+. For the evening class the correlations were —.056+ and —.25+. This relationship or rather negative relationship between scholarship and superstitions is better brought out by a comparison of the average number of superstitions for students making grades of A and B compared with students making D, E, and F. In the first test for the Liberal Arts group the A and B students averaged 8.34 while the D, E and F students averaged 9.88. In the last test the good students averaged 4.87 and the poor students 8.69. In the evening class on the first test the good students averaged 11.25 and the poor students made 12.15. In the second test the good students averaged 4.38 and the poor students averaged 8.5. It is very apparent from these results that the better students had slightly less superstitions at the beginning of the course, but their advantages stand out in the amount by which they reduced these prejudices. It is to be remembered that no attempts were made in the course to treat specifically of the problems mentioned in the test. These effects are, therefore, secondary results, but no less significant than the factual material of the course.

In order to check the type of question most often marked as *true* a tabulation was made of the records for both the first and second examination.

These results are shown in Table II. From this table we see that there was a much wider distribution of superstition before the course than after the course was completed. There was a fairly wide distribution of "trues" on the first test. On the second test such markings were largely limited to a few questions. This is equally true for both groups of students. In fact no significant differences are apparent between the two groups.

A few questions like 17, 32 and 39 are high on both examinations. This may be explained either by the fact that these questions were not discussed in the course or it is possible that the discussion

TABLE II

Showing the Relative Distribution of *True* Responses to Each Question on Both Examinations

Liberal Arts Class			Evening Class		
Question	1st Test	2d Test	Question	1st Test	2d Test
1	93	14	1	64	7
3	0	2	3	0	1
4	33	23	4	30	9
6	10	4	6	15	4
7	62	50	7	30	5
8	0	0	8	1	0
9	0	0	9	0	1
11	57	7	11	44	8
12	4	5	12	2	0
13	48	25	13	24	9
14	12	2	14	9	2
15	0	2	15	0	0
16	10	1	16	19	6
17	115	67	17	70	48
18	84	33	18	50	17
19	0	0	19	1	0
20	17	12	20	8	4
22	31	10	22	34	7
23	0	1	23	0	1
24	71	39	24	44	20
25	30	7	25	20	4
26	57	36	26	39	8
27	79	46	27	44	29
28	32	12	28	28	9
29	0	2	29	44	25
30	84	65	30	26	14
31	62	40	31	65	36
32	117	90	32	65	36
33	63	25	33	45	16
34	0	2	34	0	0
35	15	6	35	12	2
36	35	30	36	37	20
37	46	29	37	43	20
38	66	41	38	33	16
39	131	134	39	66	51
40	23	24	40	19	6

led the student to retain his original opinion which was that the correct answer to the question is indicated by "true". The latter is probably true of question 17, dealing with the problem of the effect of training on intelligence. Psychologists themselves differ in their answers to this question. On the other hand probably little was said in class about teaching logical thinking in mathematics or reasoning as the chief factor in man's superiority over the lower animals. On other questions like 1, 11, and 25 the course in psychology caused a decided change in the answers. On a few questions there was considerable difference between the two classes. This is no doubt largely due to difference in emphasis in instruction in the two courses.

QUESTIONS USED IN THIS STUDY

Below are a number of statements. Some of them you may consider true, some of them false. If you think a statement is substantially true, draw a circle around T; if the statement is false, then a circle around F. Where there is doubt mark as seems to you nearer right.

1. T F The number of man's senses is limited to five.
*2. T F Psychology is the study of human behavior.
*3. T F The opposite of red is green.
4. T F A child comes into the world with an instinctive knowledge of good and evil. This is his conscience and is born in him.
*5. T F Periods of illness appear longer than they really are at the time and shorter than it really was in retrospection.
6. T F Certain lines in a person's hand foretell his future.
7. T F If you will stare at a person's back you can make him turn around. This is a form of telepathy.
8. T F It really is unlucky to have anything to do with the number 13.
*9. T F Sensations exist in pure form only at birth or as an abstraction.
*10. T F Perceptions very seldom change even in childhood.
*11. T F A man's character can be read by noting the size and location of special developments of his head.
12. T F People with greenish eyes are not as trustworthy as people with blue or black eyes.
13. T F An expectant mother by fixing her mind on a subject can influence the character of her unborn child.
14. T F Women are inferior to men in intelligence.
*15. T F Some people can learn fifteen to twenty times as rapidly as others.
16. T F People born under the influence of certain planets show the influence in their characters.
17. T F Intelligence can be increased by training.
18. T F Long, slender hands indicate an artistic nature.
19. T F Beginning an undertaking on Friday is almost certain to bring bad luck.
20. T F If a man but had faith enough he could heal a broken limb instantly.
*21. T F A square box looks higher than it is wide.
22. T F Many eminent men have been feeble-minded as children.
*23. T F There is never an active movement of the body which is not produced by a nervous current.
24. T F You can estimate an individual's intelligence pretty closely by just looking at his face.
25. T F Some animals are as intelligent as the average human.

26. T F No defect of body or mind can hold us back if we have enough will power.
27. T F Adults sometimes become feebleminded from overstudy.
28. T F All men are created equal in capacity for achievement.
*29. T F We ordinarily have forgotten half of what we have learned in twenty-four hours afterwards.
30. T F The marriage of cousins is practically certain to result in children of inferior intelligence.
31. T F Especially intelligent children are likely to be weak and retarded physically.
32. T F The study of mathematics is valuable because it gives one a logical mind.
33. T F A square jaw is a sign of will power.
*34. T F All ideas probably originate in the gray matter of the brain.
35. T F A high forehead indicates intellectual superiority.
36. T F A person who does not look you in the eye is likely to be dishonest.
37. T F Women are by nature purer and better than men.
38. T F Fear is unnatural. It is a bad habit.
39. T F Man is superior to animals because his conduct is mostly guided by reason.
40. T F Any physical or mental disease can be contracted by thinking about it.

* The questions marked with an asterisk were inserted into the Nixon test, making forty questions in all.

THE EFFECT OF THE ATTITUDE OF THE OPERATOR ON RESPONSES IN FREE ASSOCIATION

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IN this experiment we wished to find what effect the attitude of the operator would have on the responses of the subject in free association. Eder's revision of Jung's list was given to two hundred and twenty underclassmen. The responses of this group were, however, obtained under varying conditions. Five seniors were coached previously as to the exact nature of the experiment and these men acted as operators with the underclassmen as subjects.

Two of the seniors obtained the responses from one hundred of the lower classmen. The operators in this part of the experiment took pains to impress the subjects with the importance of Freud's psychology. They emphasized the great significance of sex and while they told their subjects to give the first word which occurred to them as a response to the stimulus word, they also hinted that most of these responses would probably have a sexual nature. In other words, without definitely instructing the subjects one way or another they made it quite clear that they expected a large proportion of sexual responses.

Three other seniors gave the same list of words to one hundred twenty underclassmen. They also made an effort to influence the type of response which would be obtained. But instead of glorifying the sex instinct according to Freud, they stressed the fear reaction. Indirectly they tended to minimize Freud and slur his work, while they let it be understood that, of course, fear was the great ruling motive in these experiments which were intended to tap the unconscious.

The aim of the entire work was simply to show in a rough way what effect the attitude of the operator would have on the responses. It was really a trial between sex and non-sex rather than sex and fear. The fear vocabulary of the average individual is far more limited than are his possible sex responses, so it would be very difficult to strike a comparable basis of marking. On the other hand if we use the fear attitude in the operator—if I am allowed this phrase—merely as a means of keeping the subject's

mind off sex, we then have no such difficulty. We simply score the one as being sex-motivated and the other as a check list which was non-sex-motivated.

The marking was of the very simplest nature. In some respects the Kent-Rosanoff tables might have given better results but we were here simply seeking the crude sex responses, nothing more or less. Those words which by their ordinary connotation or by the association in which they occurred were obviously sexual in meaning were simply given a score of one; all others were completely overlooked.

On this basis we find that where the reactions were sex-motivated, the average number of obvious sexual responses per individual to the one hundred words was 10.5. With the other group we find that the corresponding figure was 7.8 which gives us a difference of 2.7, with a probable error to this difference of 3.1. Not a very impressive showing.

This showing becomes even less impressive when we realize that one of the boys took this sex motivation too much to heart and worked in a sex response on every possible occasion. He actually had the total of 49 such reactions in his one hundred words! If we eliminate him the average sex responses for the sex motivated group drops to 10.0, leaving a difference of only 2.2 between the groups.

We thus see that, for this peculiar type of free association, the attitude of the operator while probably playing a certain rôle, does not give anything like the definite results which one might easily expect. Needless to say, in the uncontrolled association of the revery type, which Freud so stresses in his practice, this might not hold. A series of experiments will be undertaken during the school year to throw light on this point.

PSYCHOPATHOLOGY OF ALCOHOLISM[1]

CASE STUDIES

By WILLIAM D. TAIT
MC GILL UNIVERSITY

WHY does mankind desire alcohol, and why does its consumption increase with civilization? Certainly not for its taste, nor for its food-value in a direct way. Its use, for some individuals may be called a psychological necessity, just as for others its non-use may be a psychological necessity. A study of the situations in which it is used, and of those who use it, brings out some very interesting points to the psychologist.

Alcohol, or its equivalent, is demanded by some people undergoing emotional strain or stress, that is, during sickness, trouble, bereavement, horrors of war, and, strange to say, at the other end of the scale, during festivities, weddings, celebrations, release from horrors of war, etc. In the former instances, it provides a relief from a load which is too hard or heavy to bear, because of its repressiveness, while in the latter instances it prevents cares and worries from interfering with a situation or situations otherwise joyful, and thus enhancing the pleasure. The end to be obtained in either case is the same—release from, or prevention of repression, and even a compensation for joys and pleasures missed. In the mental state produced by alcohol we find a rosy and comfortable world (*i.e.*, the day before); our problems are solved and our wishes fulfilled. It is a day dream produced at will. There is found the explanation for "Dutch Courage", for the fear complex is no longer dominant. It even removes the fear of being afraid.

There is truth in the statement that as civilization increases so does the consumption of alcohol. Some may doubt this, but it is true that not only is more alcohol consumed, if it can be obtained, but it is taken more frequently, and even in private. In more primitive times it was taken mainly on certain social occasions, on what might be termed unusual occasions—not as a matter of daily routine, such as we find at present.

[1] A Canadian can discuss this matter without incurring the danger of having his cellar raided,—if he has one.

It is true, of course, that it is easier to make in a civilized environment, but that does not explain the matter, for mere ease of manufacture would not of itself conduce to its use. The wish is father to the deed. Why is the situation thus? Evidently because civilization, as we interpret it, insists upon building up convention upon convention, and this implies repression and ever more repression, until the breaking point is reached, and relief must be found. The "wee droppie" affords prompt, albeit, temporary relief. Not only does civilization by means of its convention increase repression, but by its increased organization and complexity, it increases the chances of failures as well as successes, thus necessitating compensation. Again, alcohol comes to the rescue. Repression and compensation are therefore the two great psychological factors in the use of alcohol.

It is probably the introverts who suffer most, and it is amongst those that we find the secret drinkers. Those individuals who are retiring, who, so to speak, live to themselves, repress more, and therefore there is more need for an outlet. Hence not only the secret drinker, but the periodic outbursts on the part of some, known as sprees, which, by the way, are not always alcoholic. The same phenomena are in evidence with regard to different races, or peoples. Certain races may be said to be more introvert, others more extrovert. It is among the introverts that we find the greatest incidence of suicide, and at the same time, the greatest use of alcohol in its more potent forms—the hard liquors.

To illustrate the point discussed, three cases, out of twelve, which have been rather closely examined, are submitted as being more or less typical.

CASE I

This is a man about forty-five years of age. He is above the average in intelligence, but neglected school in his younger days and now realized his defeat, for others less talented now occupy high positions. He married a woman older than himself, who has intense ambitions to rise in the social scale, but will not save to attain them. She wishes to climb in a hurry. The man is aware that he has failed to materialize, and his wife adds to the fuel. In his state of intoxication his conversation is on the subject of why he is not further on in life, and all the blame is placed upon others or upon his environment. Then follows a period of the great and big things he intends to do and the position of power which he will finally obtain. At the same time he is arrogant, assertive, impatient, domineering to all those about him, refusing

to do anything suggested by anyone. He is for the time being "lord of creation". Sober, he is kindness itself—drunk, the essence of tyranny. In this state he is powerful, rich and successful, all of which are lacking in his daily life.

CASE II

This is a woman, also of exceptional ability, who partly earns her own living by her writings, because to a large extent her husband, who aspires to be a literary person, is unable to support her in the lap of luxury to which she was accustomed. She occupies a very responsible position in a large financial house, and is thoroughly capable. Sprees are periodic, and the same features are found here as in Case I. The unfortunate marriage is lamented. She becomes most assertive, although in daily life quite the reverse. She refuses to do anything which her children or friends may suggest. She, too, has social ambitions which have been only partially realized, but in the hilarious state she attains wonderful stages of social prominence. Her husband has been unable to provide the social prominence desired, but in the spree realizes her intellectual, social and æsthetic ambitions as well as the forgetfulness of failure incident to her daily life. She has removed repression and found compensation—for the nonce.

CASE III

This is the instance of a clergyman who occupies a high position in church and state. He is a scholar of no mean ability, being the author of several treatises. In ordinary life, humble, retiring, a bachelor—almost an ascetic. On a spree, he is assertive, domineering, contrary, lustful and essentially a man of the world. The whole is a compensation for the repression imposed upon him by his calling.

From the three sample cases cited it is evident that even repression raised to the *nth* degree will not alone account for the use of alcohol or sprees. Repression by itself is not a complete explanation. The further clearing up of the situation is evident if we regard the exhilarated state as one of compensation. Here wishes are fulfilled, ambitions realized, plans materialize, fame results, power over others is acquired, all those things in word which have been desired or repressed in daily life. It is a compensation brought about by the alcoholic day-dream. This compensation state is pleasant and satisfactory, hence the continued use of alcohol. As in the case of other day-dreams, good may

result if they are in touch with reality, and for this reason alcohol may be of value to some intellects. In a way, the alcoholic is a neurotic, because he attempts to leave the problems of life, rather than face them. Yet neurotics have their place in the world, and many of them have been of great value. For some of them, alcohol solves, even temporarily, the conflict of living. Even this artificial and momentary relief may be of value to them and the world in general, and may prevent more serious neuroses. Until another way is found to prevent or solve mental conflicts, alcohol or its equivalent will always be desired and used by human beings. Apparently, one way out would be to let certain people drink themselves to death, bring about self-elimination, and thus produce a race which had no conflicts, and therefore required no solvent. We are either beyond that stage of society or else we have not reached it. Meantime some will get drunk and some will not, because some natures are more sensitive to the tension and conflicts of life—some neurotics.

NERVOUS INSTABILITY AND GENIUS: SOME CONFLICTING OPINIONS

By PAUL A. WITTY AND HARVEY C. LEHMAN
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MANY of the earlier writers were inclined to believe that the genius is characteristically eccentric and often unbalanced. Indeed, there are some at the present time who assert that much of the work of genius is itself a manifestation of maladjustment or instability. However, the painstaking research of Terman, Hollingworth, *et al.*, has yielded abundant convincing data for those who see correlation, not compensation, in human nature, for those who therefore find the genius usually possessing inordinate amounts of desirable characteristics and conspicuously lacking in undesirable traits or proclivities.

A present-day attitude that is gaining rather general credence is exemplified by Terman who has stated that the eccentricity of genius is largely a myth, and that from the ranks of the gifted (I.Q. 140 and above) *and from nowhere else* our geniuses in every line of endeavor are recruited.

"The data show that the physical and mental traits which characterize typical gifted children appear to warrant the belief that more intense educational effort in their behalf on the part of the school would not involve the risks which various writers have feared. The 'eccentricity of genius' is largely a myth." (1) p. 184.

"One reason for the general neglect of this field of pedagogy has been the widespread belief that the apparently gifted child is merely precocious, and usually pathologically so. However, recent experimental studies have shown *conclusively* that this belief has little or no foundation in fact. All the scientific evidence at hand points to the conclusion that gifted children are superior to unselected children in physical and non-intellectual mental traits as well as intelligence and that they carry this advantage into adult life. *We are coming to recognize that from their ranks and from nowhere else, our geniuses* in every line are recruited.*" (2) p. vii. (Italics ours.)

* In an article which appeared earlier in this JOURNAL (see Vol. 24, p. 77) in which the above quotation was employed, Terman's statement was slightly mutilated by substitution of the term "leaders" for the term "geniuses". The latter word is the one employed by Terman.

In the above quotation we have the extreme point of view set forth. From the gifted (children of I.Q. 140 and above) and from nowhere else our geniuses in every line are recruited. Here we have over-simplification in the extreme—genius in every line of endeavor reduced to a magical formula—I. Q. 140 and above.

Cox has corroborated the work of Terman which dealt chiefly with gifted children, by rating three hundred proven geniuses on a very long list of traits; sixty-three of the traits were ones which are commonly considered desirable. The following results are reported:

"I took a long list of mental, moral, and volitional traits, worked out by Webb, an English psychologist, and rated my three hundred geniuses by it. Sixty-three of the traits on that list are those which we deem especially desirable in present-day children. They furnish a pretty complete picture of a girl or boy, and show what sort of stuff the children are made of. . . .

"The inspiring thing is that the geniuses, even as children, passed this test with flying colors." (3) pp. 93 f.

The validity of Miss Cox's ratings of the three hundred geniuses is certainly open to question in view of the numerous investigations which have shown the fallacy of ratings in general.[1] However, the point of view expressed by Cox exemplifies a widely disseminated and generally accepted attitude.

A BRIEF HISTORICAL RESUMÉ

The past has brought many intense conflicts of opinion regarding the sanity of genius. A controversy was particularly acute toward the close of the last century. Nisbet in *The Insanity of Genius* studied 250 men of genius (4). He found *all* to be neuropathic, suffering or dying from some nervous disorder. (4) p. 315. Not only did Nisbet assert that instability and genius accompany each other, but he held that genius is directly proportional to the amount of instability exhibited by the subject.

[1] It is true that each genius was rated by two co-workers in addition to Miss Cox. The validity of the results is none the less open to question. Realizing the futility of most attempts at rating character, a committee of the American Council on Education recently made the following recommendations: "The committee believes . . . that those who rate individuals should rate only those traits they themselves have had the opportunity to observe and that if they must rate large numbers of students the number of items should not exceed five." See Robertson, D. A.: "A Coöperative Experiment in Personnel Procedure." *Sch. and Soc.*, 1927, 26, 275–277.

"Whenever a man's life is at once sufficiently illustrious and recorded with sufficient fullness to be a subject of profitable study, he inevitably falls into the morbid category. . . . And it is worthy to remark that, as a rule, the greater the genius, the greater the unsoundness." (5) pp. 16 f.

Nordau is another writer who, with Nisbet, emphasized the abnormality of genius (6). In his book *Degeneration* he attempted to prove that genius and degeneration are closely related. Such a position was sure to arouse opposition. Wm. James wrote that Nisbet's book was a pathological manifestation of the author's own temperamental restrictions. He asserted also that the book possessed little or no scientific value (7).

Wm. James also attacked Lombroso who advanced the theory that genius is a degenerative neurosis allied to epilepsy and moral insanity[2] (7, 8). In reply to the invectives directed toward his first book Lombroso wrote a second in which he attacked his critics (9). James in reviewing the second book insisted that Lombroso's incapacity for accurate reasoning was incurable (7).

In 1894 an important book upon the subject of genius appeared. This was the work of William Hirsch, *Genius and Degeneration* (10). The author asserted that genius is primarily a sociological, not a psychological phenomenon. He criticized the work of Nordau *et al.*, as unsound and inadequate. Of this book James wrote:

"It really reanimates one, after so much farce-comedy writing on the subject of genius, to come upon a book based upon psychological analysis, logic, and common sense. It would be well if all the admirers of Lombroso, Nisbet, and Nordau, could be compelled to read Dr. Hirsch's admirable study, of which every page is interesting and acute. . . . The author remarks 'genius' is a sociological, not a psychological concept." (7) p. 290.

"With strong obsessions one needs a strong will to keep sound, just as with a large body one needs large legs to keep active. The excessive sensibility of a Goethe would have made a psychopath of him, but for his extraordinary intellect and self-control—with these additions it simply made him a mightier pattern of mankind." (7) p. 291.

Although many emphatic assertions were made about 1890 regarding the relationship of nervous instability and genius, the concept of the interrelationship of the two was by no means a new one at that time. Hirsch belittled the theories of his contemporaries pointing out that the concept that genius and insanity are

[2] Lombroso's exact words are as follows: "Genius is a symptom of hereditary degeneration of the epileptoid variety, and is allied to moral insanity." (5) Pp. 16f.

related had been presented frequently in earlier writings, that the doctrine was by no means original nor was it revolutionary. (10) p. 71. He deplored the tendency then manifest to attach so much significance to this idea. It is true, of course, as Hirsch indicated, that the literature of every age contains numerous allusions to the intimacy of nervous instability or insanity and genius. Aristotle remarked that those who have been eminent in philosophy, politics, poetry, and the like *all* were victims of melancholia. (10) p. 71. Dryden too pointed to the same phenomenon.[3]

In this connection the words of Edgar Allan Poe are of interest:

"I am come of a race noted for vigor of fancy and ardor of passion. Men have called me mad; but the question is not yet settled, whether madness is or is not the loftiest intelligence; whether much that is glorious, whether all that is profound, does not spring from disease of thought,—from moods of mind enacted at the expense of general intellect." (11) p. 22.

It is unnecessary to multiply instances of the concept stated above. In the literature of the past one sees so often the statement that lack of mental balance and genius are correlated that he wonders how such a concept could have received *general credence* if the eccentricity of genius is really a myth. Prose and poetry of all ages contain numerous examples of this generally accepted theory.

Although one finds frequent allusion to the intimacy of association between nervous instability and genius in the prose and poetry of every age, one of the first long, serious discussions of the subject was that of Moreau de Tours in 1859 (10) p. 71. This writer considered genius to be a positive disease consequent upon over-excitation of the brain. He felt that genius itself is a neuropathic trait. To this position many writers took exception; the literature subsequently is largely controversial and speculative.

One could give countless examples of the two positions tenaciously defended in the literature prior to the writings of James, *et al.* The question was brought to a focus about 1890–1900 and much of the subsequent literature is repetitious. It is obvious to the careful reader that the method employed by Lombroso, that simply of enumeration of geniuses with psychopathic or unstable traits is of questionable validity. Accuracy in this regard would involve precise definition of "psychopathy" and of "genius".

[3] "Great wits are sure to madness near allied
And thin partitions do their bounds divide." (10) p. 71.

This neither Lombroso nor his followers did. Accuracy would involve further ascertaining the exact number of psychopathic individuals in the population at large, and the number of psychopathic or insane among geniuses. James pointed out that such statistics were unattainable and therefore were not assembled by any of the advocates of the neurosis theory. (7) p. 291.

In the opinion of Wm. James, the lop-sidedness of genius is not an inseparable trait of genius. He insisted that the *combination of traits* is the most important factor in determining whether an individual will or will not become a genius. He stated that no single element can be thought of in itself as the determiner of genius. When combined with extraordinary intellect and self-control, such factors as high sensitivity, impulsiveness, obsession, etc., often facilitate or hasten the development of the inchoate genius. These integers are not the cause of genius although James made clear the fact that geniuses often manifest "lop-sidedness of character." (7) pp. 293 ff.

". . . it is one thing to have this intellectual condition of genius and another to become effective in history *as* a genius, and to figure in biographical dictionaries. We all know intellects of first-rate original quality whose names are written in water because of the inferiority of the other elements of their nature, their lack of remote ideals and unifying aims of passion and staying power. On the other hand we know moderate intellects who become effective and even famous in the world's work because of their force of character, their passionate interests and doggedness of will. To *do* anything with one's genius requires passion; to do much requires doggedness. Hence it comes that the intense sensibility of the psychopathic temperament, when it adds itself to a first-rate intellect, greatly increases the chances that the latter will bear effective fruits. To be liable to obsession by ideas, not to be able to rest till they are 'worked off', ought then to be, as they indeed are, traits of character often found amongst men whose names figure as those of geniuses in the cyclopedias. But these traits have no essential connection with the sort of intellect that makes the men geniuses. We may find them combined with any sort of intellect, as we find first-rate intellect combined with any sort of character." (7) pp. 293 ff.

THE CHANGE IN WM. JAMES' THINKING

It is of interest that while James protested vigorously against the extreme positions of Nisbet *et al.*, he later became sympathetic with the point of view advanced by these advocates of the neurosis theory. In his later writings, he admitted that the nature of genius has been much illumined by the attempts to associate genius with psychopathic tendencies. He stated that when a superior intellect

is combined with a certain type of psychopathic temperament the best possible condition for the kind of effective genius that gets into the biographical dictionaries is provided.

"Similarly, the nature of genius has been illuminated by the attempts, of which I already made mention, to class it with psychopathical phenomena. Borderland insanity, crankiness, insane temperament, loss of mental balance, psychopathic degeneration (to use a few of the many symptoms by which it has been called), has certain peculiarities and liabilities which, when combined with a superior quality of intellect in an individual make it more probable that he will make his mark and affect his age, than if his temperament were less neurotic. There is of course no special affinity between crankiness as such and superior intellect, for most psychopaths have feeble intellects, and superior intellects more commonly have normal nervous systems. But the psychopathic temperament, whatever be the intellect with which it finds itself paired, often brings with it ardor and excitability of character . . . when a superior intellect and a psychopathic temperament coalesce—as in the endless permutations and combinations of human faculty, they are bound to coalesce often enough—in the same individual, we have the best possible condition for the kind of effective genius that gets into the biographical dictionaries. Such men do not remain mere critics and understanders with their intellects. Their ideas possess them, they inflict them, for better or worse, upon their companions of their age. It is they who get counted when Messrs. Lombroso, Nisbet, and others invoke statistics to defend their paradox." (12) pp. 22–24.

The quotation given above exemplifies a change in James' thinking. This change is interesting to trace. From a position of violent antagonism to the writings of Nisbet and Nordau, James gradually progressed through the stages of tolerance of, extreme interest in, and finally partial acceptance of certain theories. In the light of his earlier writings it is startling that James finally should have asserted that religious leaders are *invariably* creatures of exalted emotional sensibility *driven to attain places of authority and eminence by pathological features of their personalities.*

". . . like many other geniuses who have brought forth fruits effective enough for commemoration in the pages of biography, such religious geniuses have often shown symptoms of nervous instability. Even more perhaps than other kinds of genius, religious leaders have been subject to abnormal psychical visitations. Invariably they have been creatures of exalted emotional sensibility. Often they have led a discordant inner life, and had melancholy during a part of their career. They have known no measure, been liable to obsessions and fixed ideas; and frequently they have fallen into trances, heard voices, seen visions, and

presented all sorts of peculiarities which are ordinarily classed as pathological. Often, moreover, these pathological features in their career have helped to give them their religious authority and influence." (12) p. 5.

THE CHANGE IN ATTITUDE OF SIR FRANCIS GALTON

The modification of James' views regarding the correlation between genius and abnormality finds a parallel in the alteration in the attitude of Sir Francis Galton, a noted student of genius. In the first edition of *Hereditary Genius* Galton stated that an unsound constitution is *not* the usual accompaniment of genius, that the genius usually possessed a strong body. He admitted that a surprising number of the ablest men appear to have left no descendants, but he ascribed this fact to causes other than an inherent tendency to barrenness in these person. (13) p. 320 f. The point of view advocated by Galton in his early writings first appeared in 1869. Upon reprinting his volume twenty-three years later Galton inserted a prefatory chapter in which he displayed a pronounced change in attitude.

"The relation between genius . . . and insanity, has been so much insisted upon by Lombroso and others, whose views of the closeness of the connection between the two are so pronounced, that it would hardly be surprising if one of their more enthusiastic followers were to remark that so-and-so cannot be a genius, because he has never been mad nor is there a single lunatic in his family.[4] I cannot go nearly so far as they, nor accept a moiety of their data, on which the connection between ability of a very high order and insanity is supposed to be established. Still, there is a large residuum of evidence which points to a painfully close relation between the two, and I must add that my own later observations have tended in the same direction, for I have been surprised at finding how often insanity or idiocy appeared among the near relatives of exceptionally able men. Those who are over eager and extremely active in mind must often possess brains that are more excitable and peculiar than is consistent with soundness." (13) p. *ix*.

Galton is cited often as an able and strong adherent of the doctrine that nervous instability and genius are *not* intimately associated. Such citations do not justly represent the true attitude of Galton for in his late years he modified his earlier position as shown in the preceding quotation. His later position as well as his earlier one should be given careful consideration by students of abnormal behavior. It was twenty-three years after publishing the original edition of *Hereditary Genius* that Galton presented his modified view emphasizing a "painfully close relation" be-

[4] It is significant that Galton defends his change in attitude by pointing to the fact that he is still not so extreme as certain others.

tween genius and insanity. Thus, Galton, like Wm. James, after years of study and meditation, concluded that those who are "extremely active in mind must often possess brains that are more excitable and peculiar than is consistent with soundness".

FEEBLEMINDEDNESS AND CRIMINALITY

After the period 1890–1900, there recurred at various times spasmodic interest in the age-old question of genius and instability. One development is so striking that it deserves special mention. After the advent of the mental test, certain workers became convinced that the majority of the insane and criminally inclined were to be found among the feebleminded. Thus, the pendulum swings and insanity instead of being associated with superior ability is alleged to be intimately related to its opposite, namely, restricted ability.

Of interest in this connection is Terman's statement of 1916 that every feebleminded child is a potential criminal. (14) p. 11. Recent studies have shown the fallacy of Terman's position. Murchison's extensive study shows that the population of certain prisons is *not less* intelligent than average men, but *more* intelligent. Indeed, in one penitentiary the average intelligence-score of the criminals was 75 per cent higher than that of the guards.(15)

Mateer expresses a commonly accepted view that psychopathy is without marked relationship to intelligence. (16) p. 148. Thus, the period 1890–1925 saw every phase of the age-old problem presented, the dogmatism recurring again and again. It is striking that so eminent a student as Goddard wrote in 1920 that there is only a slight gap between genius and insanity. (17) pp. 511 f. It is of further interest that Havelock Ellis asserted in 1926 that the genius is closely related not to the insane but to the congenital idiot.

"It is no paradox to say that the real affinity of genius is with congenital imbecility rather than with insanity. If indeed we consider the matter well we see that it must be so. The organization that is well adapted for adjustment to the ordinary activities of the life it is born into is not prompted to find new adjustments to suit itself. The organic inhibition of ordinary activities is, necessarily, a highly favorable condition for the development of extraordinary abilities, when these are present in a latent condition. Hence it is that so many men of the highest intellectual aptitudes have so often shown the tendency to muscular incoördination and clumsiness which marks idiots, and that even within the intellectual sphere, when straying outside their own province, they have frequently shown a lack of perception which placed them on scarcely so high a level

as the man of average intelligence. It is not surprising that by means of the *idiots savants*, the wonderful calculators, the mattoids and 'men of one idea', and the men whose intellectual originality is strictly confined to one field, we may bridge the gulf that divides idiocy from genius." (18) p. 206 f.

THE GENETIC STUDIES OF GENIUS

After the researches of the mental testers, the old theory that nervous instability and genius go hand in hand, fell into disrepute for the results of the genetic studies of genius were disseminated widely. Such a popular magazine as the *American* presents to thousands of credulous readers to-day the statement that the three hundred men of genius studied by Miss Cox were exceptionally stable and well-balanced. (3) pp. 37 ff.

In making her study of geniuses it was necessary of course for Miss Cox to depend largely upon biographical material. The weaknesses of the biographical method were emphasized by Nisbet when he wrote the preface to his book appearing in 1891.

> "The biographer, unfortunately, is too often as troublesome a person to deal with as the family nurse. It is difficult to learn the essential facts of a great man's life if they conflict, as they not infrequently do, with the biographer's notion of greatness. Commonly, the writer falls in with the popular view of genius, which is that a certain quasi-divine influence, or *afflatus* of an inscrutable nature, descends upon certain individuals after the manner of the Holy Ghost. . . . In any case, the smallest suggestion that the object of his veneration has not been entirely sane, affects the ordinary biographer as a red flag affects a bull." (4) p. *xvi.*

The significance of the work of Terman, Hollingworth, and Cox will doubtless be granted, but the postulates from which they proceed will be subject to controversy. These writers have neglected the somewhat esoteric concepts of the psychoanalysts. Whether it is a resistance to the psychoanalytic hypotheses or a *domination of the concept* derived from genetic studies of gifted children that accounts for the neglect of this point of view is not clear. At any rate, it is noticeable that little attempt is made by these writers to interpret the genius in terms of either inherited or acquired deviation in drive, the familiar tool of the psychoanalyst. Since the child of I.Q. 140 and above is essentially stable and since, according to Terman, from the ranks of such children our geniuses in every line of endeavor are to be recruited, these writers probably find little need for utilization of the concepts and postulates of the psychoanalysts.

THE PSYCHOANALYTIC SCHOOL

The special technique employed by those who interpret genius by psychological analysis is a product of the past fifteen years. The technique had its origin in part in the work of the historians. Barnes in 1919 emphasized the importance of interpreting history in psychological terms. (19) He characterized history as the collective sublimation of the neuroses and psychoses of the great personalities of history. Barnes and others have employed psychological analysis to interpret historical movements and crises as well as to understand historical personalities. Psychological analysis has been found useful also in studying certain aspects of social reform and political control. The approach, while not entirely Freudian, makes use of certain concepts similar to those used in psychoanalysis. Most of the studies have involved or implied the existence of such concepts as instinct, unconscious motivation, infantile sexuality, etc.

The student of psychology is often impatient with the vague and more or less mystical phrases applied to historical personalities for the writers often are content merely with labelling characters or movements. Such labelling is not interpretation; it is of doubtful validity. The practice has resulted partly from the fact that conspicuously few academic psychologists have utilized the vague concepts of the psychoanalysts. The extensive literature contains few names of academic psychologists among those who have viewed history, politics, social science, or personages through the instruments of psychoanalysis. However, at the present writing psychologists appear to be acquiring a more favorable attitude toward the psychoanalytical approach (20).

Although the student of psychology is likely to be irritated by the looseness and vagueness with which terminology is employed in psychoanalytical literature, he must recognize the significance of this approach in the study of genius. The collective conclusion gleaned from all the literature seems to be opposed diametrically to the views advocated by Terman, Hollingworth, and Cox. The eccentricity of genius is not a myth. The psychological analyses of character point to the conclusion that psychopathic or neurotic tendencies are frequent if not invariable correlates to genius. The following quotation from Frink crystallizes definitely the attitude of the school:

"The very normal people who have no trouble in adjusting themselves to their environment, are as a rule too sleek in their own contentment to fight hard for any radical changes, or even to take much interest in

seeing such changes made. To lead and carry through successfully some new movement or reform, a person requires the constant stimulus of a chronic discontent (at least it often seems so) and this in a certain number of instances is surely of neuropathic origin and signifies an imperfect adaptation of that individual to his environment. Genius and neurosis are perhaps never very far apart, and in many instances are expressions of the same tendency." (21) p. 136.

The concept of the closeness of association between genius and neurosis again receives emphasis thus calling to account the generalizations of psychologists who hold that the genius is essentially stable. It is of course true that one might conceive of *gifted children* (I.Q. 140 and above) as quite stable, and yet find instability quite prevalent among artists, musicians, etc. The present-day writers previously referred to do not preserve this distinction (although it is sometimes mentioned). They set forth clearly that our geniuses in every line of endeavor will be recruited from the ranks of the gifted (Terman) (2) and that only the gifted can create[5] (Hollingworth). (22) p. 313. They assert that the leaders of the future are to be found among the stable and well-balanced children of 140 and above. The eccentricity of genius is a myth. If one is not convinced of the stability of genius by the studies of gifted children he may find additional evidence in the subjective analyses recently made of the eminent of the past. Miss Cox finds nervous stability to characterize geniuses of all ages. The two lines of questionable technique and generalization are accepted by many as unassailable evidence of the nervous stability and mental poise of the great and the potentially great.

To this point of view the writers offer the work of the psychoanalysts as an antidote. The genius is often neurally unstable. He is extremely sensitive and responsive to stimuli. He has a higher metabolic rate than that of normal persons; he can release and direct more nervous energy than they; he therefore possesses greater drive. He is a delicately adjusted, marvelously complex organism. Hence, he is in greater danger of functional disorders than the normal person. The genius is unstable, often neurotic, he is characteristically and almost invariably eccentric (23).

[5] It is odd that Hollingworth fails to take into account the rôle of the affective processes in the task of creating. Maurois takes a more rational position in the following statement: "Three things make a writer a creative artist—suffering, talent and desire." From a lecture delivered by Andre Maurois in McCosh Hall, Princeton University, Oct. 19, 1927. Quoted by *The Daily Princetonian*, Oct. 20, 1927, p. 3.

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ON THE EFFECT OF SIMULTANEOUS TACTUAL-VISUAL STIMULATION IN RELATION TO THE INTERPRETATION OF SPEECH

By ROBERT H. GAULT[1]

PSYCHOLOGISTS and many other scientific folk are aware, at least in a general way, that the writer has, during several years, been engaged in experiments with the sense of touch. Through the organs of this sense, observers are detecting and distinguishing various rates, intensities and complexes of vibration in a solid body. In a larger way, the first question of the laboratory is: How far can one go toward learning to identify tones, vocal elements, words and sentences by means alone of the tactual impressions that are occasioned by their vibrational characters in our laboratory situation. The second question is: Can the tactual experience of speech be profitably employed to supplement the eye of the deaf, *e.g.*, and to aid them in interpreting spoken language?

In this paper, we are reporting experimental work upon 22 deaf subjects: work that relates more particularly to the second question. The experiments from which we obtained the data reported here were made on December 8th, 9th, 14th, 16th and 17th, 1925; on January 14th, 17th and 26th, 1926; on May 6th and 17th, 1926; on January 2d, 17th and 18th, 1927; and on December 9, 1927, under the auspices of the Carnegie Institution of Washington.

Prior to these experiments, the subjects had participated in laboratory experiments with tactual stimuli during an aggregate number of hours that varied with the individuals. The median number is 78.5 hours.

INSTRUMENTATION

The instrumentation employed in this enterprise is designed, of course, to transmit sound. A telephone-like apparatus is used to carry stimuli from the source of energy (a speaker's vocal apparatus, *e.g.*) to a receiver that the subject or observer holds in his fingers. This receiver vibrates in unison with the speaker's

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(Dr. David Katz of the University of Rostock, Germany, has written to the author under date of November 24, 1929, saying that his pupil, M. Thiel, working under his direction has confirmed the general conclusion of this article.—R. H. G.)

voice and the subject feels the voice. At the other end of the system is a microphone at the side of the speaker's mouth so that his lips were visible. Between the microphone and the receiver are a six volt A battery, a 120 volt B battery and a three tube amplifier. We use six or eight receivers simultaneously. Each of them (in the form of apparatus we have used exclusively in the course of experiments reported here) is a device operated by a single magnet, and with a diaphragm whose natural frequency is 800 d.v.

The entire system we call the "Teletactor". It has been designed and contributed for our use by Bell Telephone Laboratories of New York City.

THE QUESTION OF TACTUAL STIMULATION FROM SPOKEN LANGUAGE AS AN AID TO INTERPRETATION

In this paper, we have assumed, in particular, the task of answering the second question above: does the feel of speech in the fingers, simultaneous with the vision of speech as the lip-reader sees it upon a speaker's face, facilitate one's interpretation? Certain data that have been accumulated in this laboratory, even without further to-do, indirectly support an affirmative hypothesis.

THE TACTUAL SENSE AN AUXILIARY TO VISION. INDIRECT DATA

Data obtained both before and since our experiments on dual tactual-visual stimulation were made, throw a good deal of light upon the question re the positive contribution that the sense of touch may be expected to make toward the interpretation of isolated words and sentences. They have already been published, in part at least, and are mentioned, therefore, but briefly here.

1. Vibrational frequencies, at least as high as 2600 d.v. a second, can be detected by the tactile organs.
2. After appropriate training, subjects are able to recognize at least ten vowel and diphthongal elements by their tactual qualities with a good degree of accuracy.
3. Likewise, they detect and distinguish at least ten consonantal and semi-vowel elements.
4. They are able to identify at least 120 sentences by their patterns as felt. This has been accomplished to from 60 per cent to 100 per cent of accuracy in 36 laboratory sessions of 45 minutes each. (*Pattern* is a term that means a complex of at least accent, emphasis, rhythm, variations of pitch and tempo or speed.)

5. An analysis of 10,140 judgments indicates that one may be expected to detect and locate accent by touch alone in bi-syllabic compounds in over 90 per cent of instances. The stimuli, in this connection, were constructed from thirteen vowel qualities combined with *l* and *s* to make as many nonsense syllables. Each syllable was combined with every other to make bi-syllabic nonsense compounds.

   These compounds were the stimuli and they were accented now on one syllable and now on the other in unknown order. The subject had to report on whether accent was upon the first or the second syllable.

6. Experiments with 102 unselected groups of homophenes aggregating 307 words (these are words that look alike on the face of a speaker, and that cannot be distinguished by the lip-reader when they stand alone), show conclusively that our subjects are able to discriminate by touch among the members of all these groups but eight, and to make their discriminations with an accuracy ranging from *fair* to *perfect*. This means that touch contributes data for judgment, in this situation at least, that vision cannot furnish. An analysis of data indicates that the criteria are most probably, in many cases, the feel of final consonants; in others, initial consonants; in others, vowels. In other cases, all these qualities combined contribute a quotum that makes for discrimination.

7. A deaf lip-reader, rated as "fair", locates accent by lip-reading little better than by chance, notwithstanding that she has been interpreting speech by this means for twenty years. She has been training in the Vibro-Tactile Laboratory, to the present date (December, 1928), no more than fifteen hours and she locates accent by means of the teletactor, when the speaker's face is hidden, in more than 80 per cent of instances. She makes such a record as this even when the pronouncer of the words is one who knows nothing of the purpose of the experiment, and who cannot, therefore, be suspected of unconsciously "throwing" the result in the direction of his preconceived notion. The pronouncer is blindfolded so that he cannot, in either the lip-reading or the touch-reading series, see the subject's face when she is about to make a verbal report. It is therefore impossible for him to guide by a sign, for he never sees her

preparing to make a right or a wrong report. Morevore, the pronouncer does not even know when the subject is attempting to read his face and is out of contact with the teletactor, and when she is feeling the pronunciation of successive stimuli, but is prevented, by means of a screen from seeing his face.

In fact, all that the pronouncer knows is that he is to say "loosloos" repeatedly, accenting now the first syllable and now the second, according as the director of the experiment (behind the subject and out of her sight) may indicate.

But one word was employed in all these experiments and the two syllables are duplicates, so as to guarantee that, but for accent, the two halves of the word will be transmitted equally.

Success at locating accent by touch is a reminder of Dr. Knudson's saying that the tactual organs can discriminate intensities of vibration as nicely as the ear.[2]

Further experiments are in progress to compare the vision of a speaking face (lip-reading) with the feel of speech as means of learning to recognize sentences by their patterns as wholes; to compare hearing with feeling in the same relation; to compare vision with feeling for detecting and locating each element of pattern aside from accent.

8. The use of the teletactor alone is superior to lip-reading alone as means of becoming acquainted with the number of syllables being spoken. This comparative study has been made in relation to only three deaf cases and the reactions to each one have proved the point. Eighty sentences have been employed for the purpose. They were all outside the lists that were requisitioned in relation to other experiments that are under discussion in this paper. The figures in this connection are quoted below:

Subject	Rank as Lip-Reader	Detection via Lip-R.	Detection via Teletactor
1	Mediocre	24%	40.7%
2	Mediocre	25%	46%
3	Good	35%	60%

[2] For more details of data summarized above see: *Jour. Frank. Inst.*, Vol. 204, No. 3, Sept., 1927, pp. 329–358; *Arch. of Otolaryngology*, Vol. 4, Sept., 1926, pp. 228–239; JOURNAL ABNORMAL AND SOCIAL PSYCHOLOGY, Vol. XXII, No. 1, April-June, 1927, June, 1927, pp. 33–39; *Jour. of Gen. Psychol.*, Vol. II. Also: Knudsen, "Hearing" with the Sense of Touch; *Jour. Gen. Psy.*, Vol. I, No. 2, April, 1928, pp. 320–352.

DIRECT EVIDENCE

The foregoing paragraphs Nos. 5, 6, 7 and 8 contain indirect evidence for the hypothesis that dual (tactual and visual) stimulation from spoken language may be expected to guarantee more successful interpretation of speech than visual stimulation alone (straight lip-reading). Exclusive of these data, the material referred to in paragraphs 1 to 5, inclusive, has been collected for the purpose of discovering what are some of the things that tactile organs can do in the way of receiving forms of spoken language, irrespective of the means by which they can be best received.

What is the direct evidence? Deaf subjects in our laboratory are enabled to see the face of a speaker and, simultaneously, through the teletactor system, to feel his words in their finger tips. Do they interpret speech in this dual stimulation situation any better than they can as unaided lip-readers? Briefly, the answer is affirmative, as the indirect evidence suggests it may be. This conclusion is based upon the laboratory's experience, as has already been stated, with 22 deaf subjects. The median time they had spent in the laboratory at work, prior to participation in the tests on which this paper is based, was 78.5 hours. Their laboratory exercises were directed toward training them *to be attentive to tactual stimuli* from the human voice that is made to produce vibrations in the diaphragm of the teletactor system; to distinguish and memorize vowel qualities by their feel; to distinguish and memorize the patterns of English sentences. Their training was about equally divided among these types of exercises.

In all, a total of 124 records were obtained from the 22 subjects. Eighty records were from six observers; the remaining 44 from sixteen observers. Of the 124 records, 108 were confirmatory of the hypothesis: *i.e.*, they indicate a more successful interpretation of speech under conditions of dual (tactual-visual) stimulation than in the straight lip-reading situation.

SUBJECTS

The chronological age of observers in these experiments ranges from six to thirty-five years; median, 23 years. In scholastic status, 17 range from the very beginning of elementary school study to the senior year in college—equivalent, approximately, to the sophomore year in a standard college. One of the remaining five subjects was an instructor in a college for the deaf. Three others had graduated from a school or college for the deaf several

years prior to the first of these experiments. The remaining one, six years old, had never been in school.

Their residuum of hearing ranged all the way from 0–0 (0 in each ear) to 60–70 per cent. The median residuum of hearing in the more defective of our 22 pairs of ears is between 10 and 20 per cent; of the less defective, betwen 25 and 30 per cent. No one of these cases could get any help from an acousticon. Eleven are described as congenitally deaf. Of the remainder, all but two are reported as having been deafened in early childhood. These two attended schools for hearing children until they were in their early teens. It is, of course, impossible now to say whether they were able to hear speech in the course of their last years in the standard school.

Owing to lack of means for making a satisfactory measure of accuracy in lip-reading, we are able to do no more than rank these cases themselves from *no lip-reading ability* to *superior ability.* There is one case at the lower extreme and two at the upper. One of the *superior* ones, for several years, held a situation among hearing co-workers in one of the Government offices in Washington. We think she is entitled to be described as *the* superior of the whole group in this one respect. At the other extreme was a six-year-old case who had no school history. The other cases should all be ranked from *very poor* to *good* lip-readers. Going among them, day after day, one would doubtless get the impression that the median ability of the group is *mediocre,* although their school records indicate a higher rating.

THE STIMULI

The stimuli that were selected for use in these tests are of two sorts: *words isolated from sentence structures,* and *sentences.* Of the isolated words, there were 200. It is important to observe that they were all monosyllables. Of sentences, there were 116. They contain 1,026 words; 20 trisyllabic; 81 bisyllabic *and 925* (over 90 per cent) monosyllabic words. Furthermore, 89 sentences contained 10 syllables each; six contained 11; 19 contained 9 syllables each; one, 12 and one, 8 syllables.

Both isolated words and sentences were selected from a well known manual for lip-readers, with a view to having all sorts and degrees of lip-readers' problems represented in our lists.

METHOD

The method, in general, consisted in presenting isolated spoken words, visually, in a series and obtaining the subjects' interpretation. (Straight lip-reading.) The same spoken words were presented, in a distinct series, tactually and visually, *simultaneously*. (Lip-touch reading.)

In more detail: from the list of 200 monosyllabic isolated words, the experimenter ordinarily selected 100 (for one test only 50). These were taken from all parts of the total list. For another test, the remaining 100 were taken. A short series of ten words were given for straight lip-reading, followed by a short series of ten for lip-touch-reading, and so on until all words in the list had been given for both dual (visual-tactual) stimulation and single, visual stimulation. Never were *identical* short lists of ten given in immediate succession. That is if *a, b, c, d,* etc., are in a given short list for straight lip-reading, the immediately following short list for lip-touch-reading might contain *a, x, c, y,* etc. But, as has already been stated, every member of the total list was ultimately given in both ways.

In like manner, selections were made from the 116 sentences that have already been referred to. In a given test, 58, 30, 28, or 10 sentence stimuli were presented. These groups contained an aggregate of 507 to 529, 266 to 277, 241 to 252, and 114 words, respectively. The modus operandi was altogether the same, whether words or sentences were being employed as stimuli.

In no instance did the subjects receive any aid whatever excepting from the moving face of the experimenter and the vibration of the receiver. None of the stimuli, furthermore, was ever used for any purpose in this laboratory, excepting incidentally, outside the experiments we are discussing here.

Scoring in the case of word lists was made, of course, on the basis of the number of words recognized by the two methods, respectively. In the case of sentence lists, scoring was done on this basis, also, and, in addition, on the basis of whole sentences literally reported. Further comment relating to scoring reports on sentence stimuli will occur on a later page.

Certain records were obtained by the coöperation of a stranger to our cases and to the whole laboratory situation—Miss Josephine Timberlake. She came into the laboratory and pronounced the stimuli (sentences) without a preposession that results like those already obtained must be forthcoming. Her work may be described as a control test.

In the dual stimulation series, the subjects held the receiver of the teletactor system in their fingers and the experimenter held the microphone at the side of his face. In this situation, the subjects can see the speaking face and, at the same time, feel the spoken words and sentences against their fingers. It should be remembered, too, that in the straight lip-reading series, the experimenter always held the microphone in this position, also, so that in all experiments (dual stimulation and single visual stimulation) his face was equally visible.

In both series, too, the current was on so that the teletactor was being actuated by the experimenter's voice. In the single, visual stimulation series, however, the receiver was not in the subject's fingers. It was lying upon a table, diaphragm upward at the elbow of the observer. Thus, if there was any possibility that an observer with a remnant of hearing could obtain an occasional helpful auditory cue in one series, he should have the same advantage in the other. In fact, he would have a greater advantage from such a source in the straight lip-reading series; for its vibration was not dampened in this situation by contact with the subject's finger. It was, therefore, more audible, to the experimenter at least, than in the dual stimulation series.

RESULTS AND DISCUSSION

Isolated Words as Stimuli

The main results of this experiment are set out in the tables below. In the interest of economy of space, absolute scores in lip-reading and lip-touch-reading are omitted, except in Table III. There are included in Table I only the *ratios* of scores obtained under conditions of dual (tactual-visual) stimulation (lip-touch-reading scores) to those that were made under single (visual) stimulation (lip-reading scores). The stimuli in this case were drawn from our list of 200 monosyllabic words already referred to. Sixteen of these ratios were obtained when 50 words were being employed as stimuli; 31 when 100 were being employed, and one ratio was derived from the use of 132 words.

Those who are predisposed toward statistical research may inquire, at the outset (apropos of the records above and similar ones to follow), about group average ratios, mean variations, probable errors, correlations with one thing and another, and the like. This is no place for such activity, for the reason that we *are not dealing here with comparable units.* The description of our sub-

TABLE I

RATIOS OF SCORES FROM DUAL STIMULATION TO SCORES FROM SINGLE STIMULATION WHEN THE STIMULI ARE SPOKEN ISOLATED MONOSYLLABIC WORDS

1. — 1.87	17. — 1.01	33. — 1.03
2. — 1.53	18. — 1.33	34. — 1.21
3. — 1.35	19. — 1.25	35. — 1.12
4. — 1.15	20. — 1.07	36. — 2.04
5. — 1.17	21. — 1.43	37. — 1.1
6. — 1.35	22. — 1.29	38. — 1.21
7. — 2.27	23. — 1.44	39. — 1.3
8. — 1.29	24. — 1.81	40. — 1.25
9. — 1.79	25. — 1.56	41. — 2.5
10. — 1.19	26. — 1.49	42. — 1.0
11. — 1.94	27. — 1.48	43. — 1.3
12. — 1.13	28. — 1.49	44. — 5.0
13. — 0.81	29. — 1.87	45. — 3.0
14. — 1.19	30. — 1.06	46. — 0.88
15. — 1.43	31. — 1.07	47. — 1.3
16. — 1.04	32. — 1.35	48. — 1.1

Median ratio, 1.3.
Median Scores: Lip-Reading, 29; Lip-Touch-Reading, 40.

jects or observers on a preceding page makes the last statement sufficiently emphatic. Observers differ widely among themselves in respect to degree of deafness; age of onset of deafness; chronological age; school history; lip-reading ability; temperament and, in all probability, in natural intelligence. Our observers are a group only in the sense that they are together in the laboratory. In view of their manifold differences, the only comparison we are justified in making is between a given observer's record as a lip-reader and the same person's record in the dual stimulation situation—lip-touch-reading.

No characteristic of the data in the foregoing table can be attributed to aid that the teletactor affords toward making one acquainted with the number of syllables being spoken, because all the stimuli are monosyllabic.

The figures indicate, on the whole, a considerable advantage for dual over single stimulation. The words were interpreted less successfully by straight lip-reading than by lip-touch-reading. The median advantage is 30 per cent. There are nine of the 48 cases in which the ratio is under 1.1. Three of these nine records were made by one of the nineteen who participated in this experiment as subjects. This was a young woman 18 years of age who appeared for six experiments of the nature we are describing on December 8, 9, 14, 16, 17, 1925, and on May 17, 1926. On her other three appearances, dual stimulation gave her an advantage of 19 per cent, 33 per cent and 43 per cent, respectively. Prior to the first

of these six experiments in which she participated, she had worked in the laboratory as a subject during an aggregate of 138 hours.

The remaining six ratios that are under 1.1 in this list were obtained, no two of them from the same subject. Their aggregate time in the laboratory, prior to their taking part in these experiments, was 3, 4, 7, 14 and 33 hours, respectively.

Thirty-nine of the 48 ratios in the above table are within five points (a point is 0.1) above and five below the median advantage for dual stimulation that lies, as already stated, at 30 per cent. The median number of aggregate hours of prior laboratory work, in these instances, is 76. So far as our present background of experience is indicative, not many fewer than this number of hours of appropriate training can be relied upon to support our general findings.

Sentences as Stimuli: Scores Based Upon Words Recognized

The following Table II contains data that correspond exactly with those in I. Whole sentences, however, drawn from the list of 116 already described, were employed as stimuli. The scorings from which the ratios in this table have been derived were based upon the absolute number of words that were recognized by lip-touch-reading and by lip-reading respectively.

TABLE II

RATIOS OF SCORES FROM DUAL STIMULATION TO SCORES FROM SINGLE STIMULATION WHEN THE STIMULI ARE SPOKEN SENTENCES. SCORING BASED UPON RECOGNITION OF WORDS

1. — 0.9*	13. — 1.1	26. — 1.1
2. — 0.97	14. — 0.9	27. — 1.1
3. — 0.8	15. — 1.1	28. — 0.89
4. — 2.2*	16. — 1.8*	29. — 1.3
5. — 1.2	17. — 1.6	30. — 1.3
6. — 1.3	18. — 1.5	31. — 1.3
7. — 1.3	19. — 1.5	32. — 1.3
8. — 1.4	20. — 1.5	33. — 1.1
9. — 1.2	21. — 1.8	34. — 1.1
10. — 1.1*	22. — 1.05	35. — 1.1
11. — 1.7*	23. — 0.99	36. — 1.2
12. — 1.2	24. — 1.0	37. — 2.8
	25. — 1.1	38. — 1.7

Median ratio, 1.2.

Median Scores: Lip-Reading, 52; Lip-Touch-Reading, 67.

Ratios marked by an asterisk are between absolute values obtained in the control test, already referred to, that was made by a stranger to the subjects, Miss Josephine Timberlake, of the Volta Bureau, Washington, D. C.

In each of two of the 38 experiments from which the data of this table were obtained, the sentence stimuli included 87 words; each of nine, 114 words; in each of five, 252 words; in each of nine,

277 words, and in each of the remaining thirteen, 529 words. It has already been pointed out that just above 90 per cent of all these words are monosyllabic; 7.8 per cent of all are bisyllabic and slightly over 2 per cent are trisyllabic.

This table indicates also a considerable advantage for dual over single stimulation. The median advantage is 20 per cent, as in the case of isolated word stimuli. The absolute scores, both for lip-reading and lip-touch-reading are considerably higher in relation to words that are comprised in sentences than to isolated words. The median values are given in Tables I and II. The higher scores in this case were anticipated at the outset because a sentence affords a helpful context that is wholly lacking in the word standing alone.

The tendency of the context factor should be in the direction of lifting up the ratios also in Table II. But this tendency is doubtless counteracted by the higher absolute scores themselves. For obviously, as the room for improvement in interpretation by the more successful of the methods is narrowed, the *relative* rate of improvement by the less successful method is accelerated, and the gap between the corresponding scores tends to become closed.

Of the ratios in this table, eight are below 1.1. Six of these low records were made by two of the eighteen subjects who lent a hand in this portion of the work. It should be said that one of the six ratios is 1.05. The remainder are 1.0, 0.99, 0.9, 0.9, 0.97 and 0.8. The subject who made three of the nine records below 1.1, in relation to isolated words, is responsible for three entries in Table II, as follows 1.1, 1.2 and 1.7.

A subject who contributed three of the seven low ratios in the above table (1.05, 0.99 and 1.0) gave us the following ratios in Table I: 1.06, 1.07, 1.35, 1.03, 1.21 and 1.12. At the time these experiments were made, her laboratory practice had aggregated only 12 to 16 hours. Among all the 35 deaf persons the laboratory has dealt with in all its relations in the course of the last four years, this one is superior as a lip-reader. In her case, when sentences and continued discourse (as opposed to isolated words) are being employed to detect her interpretative ability, there is probably no tool that can importantly supplement her visual perception of a speaking face.

The other subject who contributed three of the seven low figures in Table II is a lackadaisical fellow of good natural capacities who has very poor lip-reading ability. In our tests employing isolated words, his ratios were 1.15, 1.17, 1.35, 1.35, 1.53 and 1.87.

Prior to the earliest test, he had had laboratory training aggregating 130 hours.

Of the 38 records in this table, 36 are within the limits of five points above and five below the median of 1.2, which suggests a median advantage of lip-touch-reading over lip-reading, of 20 per cent. The median number of corresponding aggregate hours of training, prior to the earliest of these dual stimulation experiments, is 86. This figure may be misleading when compared with the corresponding median in relation to Table I, which is 76. This difference between the two, however, is not quite so much as it appears to be, for the reason that the aggregate number of laboratory hours spent by our subjects, prior to our use of sentences as stimuli, includes all the time that they spent with dual stimulation by isolated words. This time alone amounts to from one to six hours. In a few instances, moreover, other laboratory practice intervened between the two sets of experiments.

INSTRUCTIONS TO SUBJECTS

The instructions given to subjects, when sentences were about to be pronounced as stimuli, were complicated. They were required:

1. To write down, if possible, the whole sentence as soon as they should feel it and see it upon the experimenter's face.
2. If they were unable to do this, they were instructed to make a dash on their pads for every syllable in the sentence.
3. Any word that they might recognize, they were to write in its proper place among the dashes.

Obviously these instructions demand a much more complicated reaction than is required in the isolated word situation in which the subject wrote a single word or a dash. In the whole sentence situation, the subjects were under the necessity of attending to several things: the sentence as a whole; each word individually and finally, the number of words in each sentence, so that he should be able to "dash it" in the event of his being able to report only a part of it or none of it. The situation is further complicated by the fact that if a subject has recognized but two words, for instance in a five-word sentence—the second and the fourth—he must try to place the words in their proper places: that is, between the first and the third dashes, and between the third and fifth dashes, respectively. The division of attention that all this entails might be expected to produce erratic behavior in both the lip-reading and

the lip-touch-reading series. As a matter of fact, it seems not to have done so. For, as has been stated already in Table II, 36 of the 38 ratios (over 94 per cent) are within a range of five points on each side of the median. Whereas, in Table I, 39 of the 48 ratios (just above 81 per cent) are within the same range.

Sentences as Stimuli: Scoring Based Upon the Number of Sentences Literally Reported

Reactions in the sentence stimuli situation were scored, not only upon the basis of the number of words they recognized, but upon the number of sentences they interpreted. In this connection, a rigid criterion was arbitrarily adopted. Every word must be recognized and written in its proper place. A single transposition of words, or an omission, automatically threw out a whole sentence as incorrect. It is not surprising, therefore, that scores on this basis are lower than those based upon the number of words recognized. It is an *all or none* basis.

There were thirteen reports on 58 sentences aggregating 529 words; eight on 30 sentences aggregating 266 words; six on 28 sentences, 241 words, and eleven on 10 sentences, 114 words.

As the following Table III indicates, there were two instances in which subjects registered zero in both lip-reading and lip-touch-reading. One of these subjects recognized 15 and 28 words by lip-reading and lip-touch-reading, respectively, and the other 20 and 32. Neither of them reported a literally correct sentence. But for transpositions, one of them would have scored *two* and *three* sentences, and the other *three* and *five* by the two methods, respectively. It is highly probable that they understood these sentences perfectly. There may be many other cases among the 38 represented in the table in which subjects grasped more sentences than their credit indicates. On the other hand, there is no denying the fact that what has sometimes been a correctly interpreted sentence may be, for the subject, merely a string of words—at the moment of writing them, at least. Furthermore, it is probable that there were instances in which the recognition by lip-touch-reading of but one word more than by lip-reading may have turned the scale for that method of interpretation. The facts might have been established by requiring a pantomime in connection with each report. There was no recourse to such a measure.

The figures in the table below represent both absolute values and ratios: not ratios alone as in the preceding tables:

TABLE III

REPORTS ON THE BASIS OF LIP-READING AND LIP-TOUCH-READING, RESPECTIVELY, WHEN THE STIMULI ARE SPOKEN SENTENCES. SCORES BASED ON NUMBER OF SENTENCES LITERALLY REPORTED

Number of Sentences	Correct by L.R.	Correct by L.T.R.	Ratios
1. — 58	3	2	.06
2. — 58	1	3	3.0
3. — 58	13	19	1.46
4. — 58	3	15	5.3
5. — 58	2	19	9.5
6. — 58	5	20	4.0
7. — 58	32	48	1.5
8. — 58	13	30	2.3
9. — 58	9	29	3.2
10. — 58	7	6	0.8
11. — 58	31	33	1.06
12. — 58	13	16	1.2
13. — 58	5	12	2.4
14. — 30	3	6	2.0
15. — 30	3	3	1.0
16. — 30	13	15	1.15
17. — 30	6	20	3.3
18. — 30	5	21	4.2
19. — 30	5	22	4.4
20. — 30	25	26	1.04
21. — 30	5	6	1.2
22. — 28	1	2	2.0
23. — 28	3	5	1.66
24. — 28	3	9	3.0
25. — 28	14	19	1.35
26. — 28	2	5	2.5
27. — 28	2	1	0.5
28. — 10	9*	6*	0.66
29. — 10	0*	4*	0.0
30. — 10	3	4*	1.3
31. — 10	0*	1*	0.0
32. — 10	2*	4*	2.0
33. — 10	1	3	3.0
34. — 10	2	4	2.0
35. — 10	2	3	1.5
36. — 10	1	3	3.0
37. — 10	0	0	0.0
38. — 10	0	0	0.0

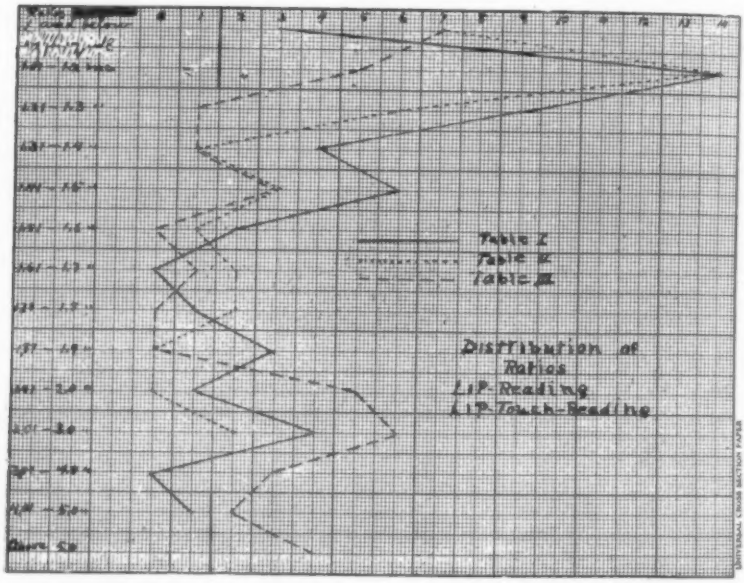
Median ratio, 2.0.
Median Absolute Scores: Lip-Reading, 3; Lip-Touch-Reading, 6.

The grand total of records in Tables I, II and III is 124. Of these, 108 are positively in favor of lip-touch-reading.

The digits marked by an asterisk indicate scores obtained from the control test in which Miss Josephine Timberlake of the Volta Bureau, Washington, D. C., acted as experimenter.

An inspection of the foregoing table will show that there are only nine ratios below 1.1. Whether we include or exclude the two cases in which no score was made by either lip-reading or lip-

touch-reading, the median ratio is 2.0. It will be recalled that the median ratios computed from Tables I and II are 1.3, and 1.2. The records in Table III are comparatively erratic, due to causes that have been discussed herein. Only ten of the 38 ratios lie within the range of five points on each side of the median. This is slightly above 26 per cent of the total as compared with the corresponding 81 per cent and 94 per cent in Tables I and II,



respectively. The median aggregate number of laboratory hours corresponding to these records is 86. Sixteen ratios are below 1.5. The corresponding median hours is 43. The thirteen remaining ratios are above 2.5. The median number of hours in the laboratory, corresponding to these ratios, is 110.

Owing to the almost uniform syllabic composition of the sentence stimuli that were employed in this section of the work, there is no more than a negligible chance that counting the syllables could give a subject the slightest clue to the sentence that was being spoken.

The data presented, to this point, clearly indicates an advantage for lip-touch-reading over lip-reading. But why? Does the tactual stimulation contribute in its own right or otherwise?

Tactual Stimuli as Mere Distraction

The question above will be at least partially answered by a discussion of the following query.

Does the tactual stimulation reënforce visual stimulation in the process of interpretation merely because it is an accessory and distracting factor? Some people declare that they can study in the midst of slight confusion more successfully than in a quiet place. But the question, as bearing upon the present work, implies a bare guess without a particle of foundation. The laboratory has made preliminary experiments that have been aimed at the question. The *modus operandi* was as follows:

An experimenter (in this case a Professor of Spoken English in Smith College who was visiting the laboratory) pronounced a list of sentences for the purpose of determining the accuracy of a deaf subject at "straight" lip-reading. There were 50 sentences in all, divided into five short series of ten each. When the first short series had been pronounced, a second was presented, but with a difference: in this case, the subject held in her fingers the receiver of the teletactor system, and a second experimenter, out of sight at the microphone, pronounced other sentences. Thus, while the subject was observing the face of the first experimenter and was attempting to lip-read, she was receiving tactual impressions of the second experimenter's sentences. By vision and by touch, respectively, she was simultaneously receiving two sets of sentence stimuli that were different and unrelated to each other. If tactual stimuli, merely *as distraction*, are positively effective in relation to interpretation, the subject should have made a better record in those alternate short series in which she was impressed by simultaneous visual and tactual stimuli, than in the other series in which she was observing the speaking face of the first experimenter, but was receiving no tactual stimulation. But the results were actually the reverse. She made a better record without the distraction of tactual stimulation, as the following table indicates:

TABLE IV

RECORDS WITH TACTUAL DISTRACTION AND WITHOUT IT

A.

100 Sentences as Stimuli Containing 795 Monosyllables, 69 Bisyllables and 17 Trisyllables

	Prof. A. Experimenter	Miss L. Experimenter
With distraction	34%	32%
Without distraction	35%	41%

B.

Recognition of Words in Above Sentences

	Prof. A. Experimenter	Miss L. Experimenter
With distraction	41%	30%
Without distraction	49%	47%

C.

The subject whose reactions furnished the above results was finally tested to obtain her record as a straight lip-reader and as a lip-touch-reader.

RESULTS

100 Isolated Words

Lip-Reading, 39%. Lip-Touch-Reading, 51%. Ratio, 1.3.

436 Words in 50 Sentences

Lip-Reading, 48%. Lip-Touch-Reading, 61%. Ratio, 1.27.

Up to this time the subject had spent an aggregate of 30 hours in the laboratory. Each successive laboratory period had been divided approximately as follows: Instruction in enunciation, 10–15 min.; drill on the patterns of sentences as felt, 15–20 min. The balance of the hour was spent on continued discourse: reading aloud in unison with the experimenter's voice as felt. She is a very intelligent person of about 25 years of age. Her facility in general conversation would probably rank her as a *very good* lip-reader, although the test figures above mean less than that. There are records of two audiometric tests in her case. One makes her residuum of hearing 50 per cent in each ear. The other makes it 40 per cent in one ear and 45 per cent in the other. The condition is described as congenital.

It may be good, as David Harum said, for a dog to have a few fleas—because of their mission as distractors from the idea of being a dog. But there is no evidence, in these preliminary figures, that tactual stimuli in our laboratory situation perform an analogously useful distracting function for the deaf lip-reader. Further work on this topic is in progress: and it should be said, in this connection, that to the present, we have no evidence upon the distraction hypothesis contrary to what is suggested by the figures above.

On the other hand, the work on homophenous words[4] already referred to and our experiments at comparing vision alone with touch alone as means for locating accent (see p. 66), afford indubitable proof that the tactual sense, in its own right, does make

[4] Publication arranged for in *Jour. Gen. Psy.*, April, 1928.

some positive contributions toward interpretation that eyes alone cannot make.

An Important Question

Is it only when one is in contact with the teletactor that one enjoys a profit from having trained in its use? At present, we have no direct answer to this question. No such answer to the query can be had till a considerable number of subjects shall have been harnessed to the teletactor continuously during several years in succession, while, at the same time, they are having conventional instruction in lip-reading, and until they shall have been compared at the beginning and at the end of the period with a comparable group who have, all the while, had parallel conventional instruction in lip-reading. Even so, iron clad conditions for such a test would be very difficult to obtain and experimenters would undoubtedly have to rely, to a great degree, upon the testimony of intelligent deaf folk who have trained for a long time in the use of the teletactor.

A priori a positive hypothesis in this relation is not unbelievable. At any rate, there is probably no normally hearing person but who believes that his acquaintance with even the conventional lilt, movement or pattern of speech helps him to get the meaning of spoken language. One of our difficulties with foreign speech, in addition to our scanty vocabulary, is just our unfamiliarity with its pattern, which normally coöperates with other spoken language factors to convey meaning. What we call "acquaintanceship with pattern" is probably, in its last analysis, a very great complex of incipient motor reactions that have been conditioned to auditory symbols, and, incidentally, to printed symbols on the pages of our books also. Now we have fully enough demonstrated that this "acquaintanceship" is made by our deaf cases through the sense of touch and the hypothesis is that the corresponding "incipient motor reactions" may be conditioned to visual symbols on the speaking face. When then the lip-reader catches facial signs of meanings, a host of meaningful conditioned motor reactions that correspond to his laboratory acquired tactual patterns, come to his aid.

But this is not the only way to answer the question. In the laboratory, we have demonstrated (in re recognition of words) a median superiority of lip-touch-reading over lip-reading of 30 per cent. In respect to the recognition of whole sentences, the median superiority runs to 100 per cent. Let us assume, if you

please, that in the schoolroom, this superiority will be reduced by one-half. Even so, the expedient of lip-touch-reading will greatly speed up the processes of learning and, consequently, the range of information, because the pupils can the better understand what is being said to them. Only this, therefore, remains to be observed: the broader and fuller one's information, the greater one's facility at jumping at meanings when signs are caught upon the face of a speaker. Thus the effect of laboratory or school training may carry over to a situation in which the lip-reader is not in contact with the teletactor.

In concluding our remarks upon this point, it is worth keeping in mind that there is a distinct possibility that an easily portable teletactor may sometime be constructed so that, wherever a lip-reader may be, he may have the direct advantage of its use.

SUMMARY AND CONCLUSION

1. When deaf subjects feel speech in their fingers through the teletactor and, at the same time, see it upon the face of a speaker, the combined tactual-visual impression enables them to interpret speech more fully and accurately than does the visual impression alone, as in straight lip-reading.

2. The median advantage (48 cases) afforded by the combined stimulation over visual stimulation alone is 30 per cent, when the stimuli are isolated monosyllabic words and scoring is made on the basis of the number of words correctly reported by the subject.

3. When whole sentences are presented as stimuli and scoring is upon the basis of the number of words correctly reported, the median advantage (38 cases) is 30 per cent.

4. When whole sentences are stimuli and scoring is upon the basis of the number of whole sentences literally reported, without even the transportation of words, the median advantage of combined stimulation (38 cases) is 100 per cent.

5. The advantage of dual stimulation over single visual stimulation does not appear to be due merely to a distracting effect of dual stimulation.

6. It is impossible that the advantage is due, in our situation, in any degree whatever, to the fact that the teletactor enables the subject to count the number of syllables being spoken, for, in the isolated word tests, all words were monosyllabic and over 90 per cent of the 1,026 words in our sentence stimuli were of one syllable. Moreover, over 71 per cent of the sentences contained

10 syllables each, over sixteen per cent have nine syllables each, and over 5 per cent contain eleven each. The remainder are of eight and twelve syllables each.

7. Other studies have shown that the deaf are able to count syllables more accurately by touch than by lip-reading; that they may be expected to locate accent to an accuracy of more than 90 per cent, and that they locate it more accurately by touch alone than by lip-reading alone. A study of reactions to 103 groups of homophenous words, furthermore, has shown deaf subjects to be much more accurate in discriminating homophenes by touch alone, than by lip-reading alone.

NOTES AND NEWS

ANNOUNCEMENT OF SOCIAL SCIENCE RESEARCH COUNCIL

The Social Science Research Council announces its second annual list of Grants-in-Aid. Altogether, thirty-seven scholars received support. On the basis of major emphasis, their projects were distributed among the social sciences as follows: Anthropology 2, Economics 6, History 16, Political Science 2, Psychology 4, Sociology 5, Human Geography 2. Most of the projects, needless to say, straddle a number of these fields. In fact, while not insisting upon it, those administering Grants-in-Aid look with favor upon projects that represent a broader approach to a problem than is possible within the limits of any one discipline.

The Grants-in-Aid of special interest to your readers are:

Clark L. Hull (University of Wisconsin)

Project: "To Work Out Experimentally Some of the More Important Phenomena of Normal Waking Suggestion."

Carney Landis (Wesleyan University)

Project: "An Investigation of the Underlying Factors in Individual Social Maladjustment, particularly the possibilities of using measurements of muscular and physiological reactions as determiners of, indicators of, or criteria of individual delinquency."

Fred A. Moss (George Washington University)

Project: "Statistical Analysis of Five Thousand Tests Given in Industry, and Ten Thousand Tests Given in Educational Institutions with the Aim of Determining the Validity of the Various Items in the Social Intelligence Test, with the Ultimate Aim of Constructing a More Valuable Device for Measuring Ability to Get Along with Others."

A. R. Gilliland and John J. B. Morgan (Northwestern University)

Project: "A Test of Introversion and Extroversion as Part of a Program of Developing Measures of Personality."

The aid granted by the Council ranges from $200 to $2000, and in almost every case is conditional upon liberal coöperation from the institution with which the applicant is connected.

The administration of Grants-in-Aid is in the hands of a special Committee of the Council known as the Committee on Grants-in-Aid. The Committee plans to hold two meetings during the coming academic year: in mid-November and in mid-March. The closing date for receiving

applications for consideration at the latter meeting is February 1, 1930. Any scholar who is a resident of the United States or Canada and who has evidenced real research ability is eligible. The Committee expects that the applicant's project will be well under way, that he can forecast the time and the money required to complete it, that it is not to be used in fulfillment of any higher academic degree, and that he has already canvassed carefully the possibility of aid from his own institution. Applications should be addressed to Walter R. Sharp, Secretary of the Committee on Grants-in-Aid of the Social Science Research Council, 230 Park Avenue, New York City.

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